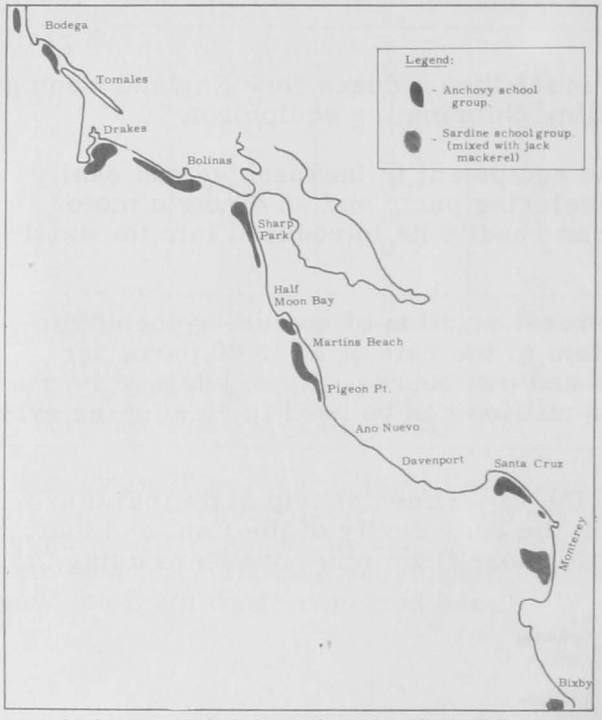
TRENDS AND DEVELOPMENTS

California

AERIAL CENSUS OF COMMERCIAL AND SPORT FISHING CONTINUED (Airplane Spotting Flight 58-17): The inshore area between Pt. Sur and Fort Bragg was surveyed by the California Department of Fish and Game by airplane spotting flight 58-17 between September 10-13, 1958, to determine the number and locations of sport fishermen and pelagic fish schools in the area surveyed. Weather conditions were ideal for aerial spotting. Clear skies and very light or no winds were encountered throughout the four days of scouting. Shore and pier fishermen were tallied on each day of the flight. The procedure on this flight was to cover the entire area from Pt. Sur to Fort Bragg at least once for pelagic fish. This was accomplished by covering a portion of the coast for pelagic fish on each of the first three days. Part of the area--Monterey to Sharp Park--was surveyed for pelagic fish on two consecutive days.



Airplane spotting flight 58-17 (September 10-13, 1958).

Sport Fishermen: It was expected that with the end of the vacation season the tally of sport fishermen would be considerably less than on flights conducted during the vacation period. The week-day flights on September 10, 11, and 12 showed some decrease in sport fishing activity; however, on Saturday, September 13, large numbers of fishermen were tallied--between 5 to 6 times as many as on each of the three preceding days and comparable to the fishing intensity noted on week-end days during the vacation period.

Pelagic Fish: Anchovies continued to dominate the central California pelagic fish population. Large concentrations were observed in the northern section of Monterey Bay, between Martins Beach and Half Moon Bay, between San Francisco and Drakes Bay and off the Russian River. Again as on the previous flight (August 17-19, 1958) many of the anchovy schools were very large in size and irregular in shape, thus precluding the use of the tally of schools as a significant measure of the relative abundance of fish in comparison with the numbers of schools observed earlier in the year. In Monterey Bay, however, there were definitely fewer schools than on the last flight, and more anchovies were observed in the Martins Beach and Bolinas Bay areas.

Schools of jack mackerel and Pacific sardines were observed in Monterey Bay and off Pt. Sur. Some of the schools in Monterey appeared to be of pure sardines; however, most were of jack mackerel with some sardines. All the sardine-mackerel schools were small in size--maximum about 50 tons--and were located from the center of Monterey Bay extending into the shallow areas off Seaside and Fort Ord.

One white sea bass school was observed off Pt. Montara.

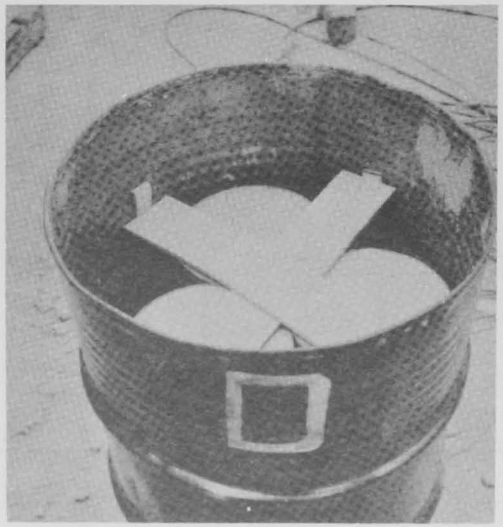
* * * * *

CONTAINERS TESTED FOR OCEANIC DISPOSAL OF RADIOACTIVE WASTE (N. B. Scofield Cruise 58-S-5-Waste Disposal): Five types of containers currently being used for the oceanic disposal of radioactive waste were tested (July 21-22, 1958) by biologists of the California Department of Fish and Game in waters 15 miles southwest of the Farallone Islands.

Duplicate units of each type of container were made and tested. No cases occurred where there was significant difference between the results from

CONSTRUCTION DETAILS

Copper tube pressure release is on the left.



Ice cream cartons held in place by battens.

Paint can with no vent.

PHOTOS SHOWING RESULTS

Exposed to 100 fathoms pressure.

Type D after descent to 400 fathoms

Type E showing damage at 400 fathoms.

the two sample containers prepared the same way. The basic container for all the tests was a steel drum of 55 gallons capacity. The sheet metal used was 18 gauge (.0418 inch). This type of package is the standard shipping container for lubricating oil and many industrial liquids. The barrels used by the waste disposal agencies in general come from the "war surplus" stock of the nearest military agency and are often dented and rusty.

Barrel A: This barrel was trash-filled and then sufficient fine gravel added to bring the total weight to 600 pounds. The lid was not sealed and six holes of $\frac{3}{16}$-inch diameter were punched in the sides.

Some waste disposal agencies have planned to use a lightly spring-loaded one-way valve to allow the entrance of sea water for pressure equalization.

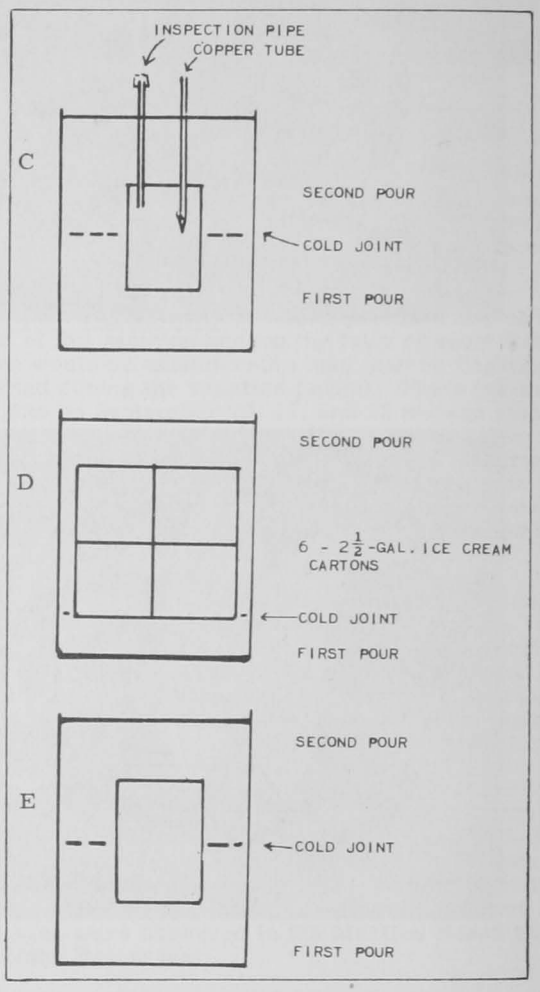
This barrel showed no damage when sunk to 100 fathoms. With the balancing of interior and exterior pressures there should be no damage to the steel container regardless of depth.

Barrel B: This was also trash-filled and ballasted to 600 pounds with gravel. Its lid, however, was fitted with a rubber gasket and bolted down watertight. With no pressure equalization this container collapsed to the point where the lid seal was broken. This bending-in occurred at less than 100 fathoms. After the air escapes and the water pressures inside and out become equalized no additional change would take place. None of the solid contents of the container was released.

Barrels C, D, and E all depend on concrete for integrity of their contents as the heads were cut out of the barrels. All concrete used was five sacks of cement to the cubic yard with $\frac{7}{8}$-inch maximum gravel. This represents a proportion of one part of cement to three of sand plus three-and-a-half of gravel. The mixing was done in a transit-mix truck. The first pour of concrete was cured in six days before adding the covering layer. The second pour was cured five days before testing. All cement embedded containers in the following tests were left void. As the encasing concrete will withstand a pressure of over 100 pounds per square inch, the presence or absence of compressible filler would not influence the results.

Barrel C: A five-gallon paint can was wired as possible. The space between the paint can and the drum was filled with concrete to a point halfway up the drum. The paint-can lid had two holes made in it so pipes could be inserted and extend upward to above the top of the drum. One tube was soft copper water pipe, $\frac{1}{2}$-inch diameter. The end inside the can was hammered flat and folded over. This was to act as a controlled pressure release inward, allowing the enclosed paint can to fill with enough sea water to equalize the pressures inside and outside. The second connection of the can to the exterior was a standard $\frac{3}{8}$-inch iron pipe capped on the exposed end. A flange was welded to this pipe to prevent seepage of water along the pipe or endwise movement due to water pressure. This tube was an inspection opening as water might slightly open the seal on the copper tube and enter without being evident from the exterior. Barrel C was subjected to pressure of over 1,000 pounds a square inch at 400 fathoms. The sealed copper tube burst as planned and no damage was sustained by the container.

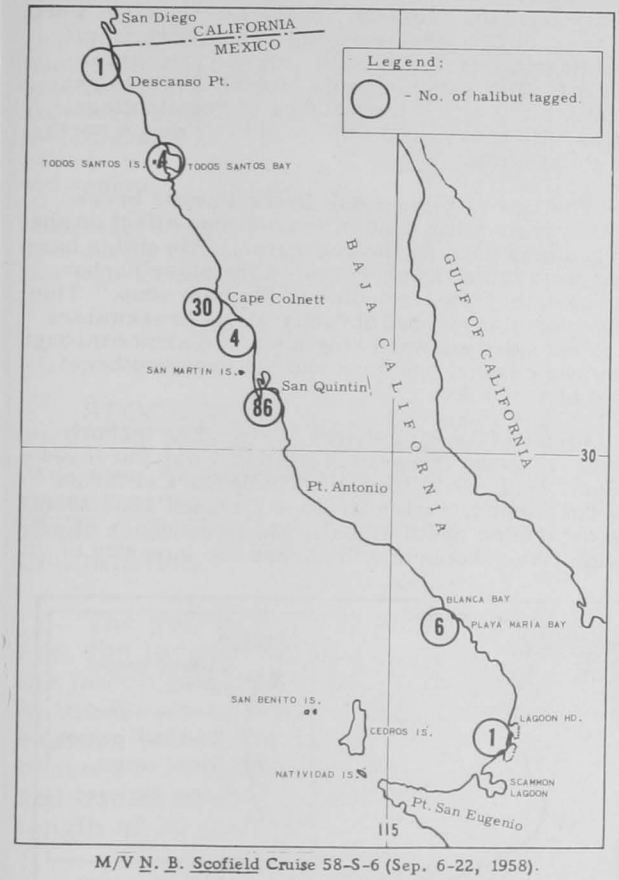
Barrel D: This drum had concrete put in it to a depth of eight inches. After this layer in the bottom had hardened, 6 empty ice cream cartons of $2\frac{1}{2}$ gallons each were placed in the barrel as centrally as possible and fastened in place with wood battens. The remainder of void space was then filled with concrete. Barrel D went 400 fathoms deep. An obviously violent implosion crushed in the side. The metal of the drum was ruptured along two lines which could not happen if the water had leaked slowly into the void spaces through gradual cracking of the concrete and slow tearing of the steel.



Barrel E: This arrangement was the same as Barrel C with the five-gallon paint can enclosed in concrete. However, there was no connection between the enclosed paint can and the exterior. When this test unit was sunk to 400 fathoms the end collapsed with a cylindrical hole over the paint can equal in diameter to the can. The concrete was six inches thick over this area.

* * * * *

HALIBUT SURVEY OFF BAJA CALIFORNIA COAST (N. B. Scofield Cruise 58-S-6-Halibut): The coast of Baja California from the border to Cedros Island was surveyed (Sept. 6-22, 1958) by the California Department of Fish and Game research vessel N. B. Scofield to secure a large



M/V N. B. Scofield Cruise 58-S-6 (Sep. 6-22, 1958).

sample of California halibut for tagging purposes, morphometric studies, and length-weight-age studies. Other objectives were (1) to determine what physical and oceanographic conditions prevail in the areas where adult halibut, and their eggs and young are found; and (2) to test the efficiency and practicality of trawling gear in Mexican waters.

Sixty-one 15-minute hauls were made at various locations from just below the border to a point a few miles below Scammon Lagoon. In these hauls 216 sharks, skates, and rays were taken along with 284 bony fish. Halibut composed 60 percent of the catch of bony fish, fantail sole 13 percent, and diamond turbots 11 percent.

Approximately 170 halibut were taken in the trawl nets; 132 of these were tagged, the remainder preserved for routine laboratory examination.

Surface temperatures ranged from 73° F. to a low of 60° F. at San Quintin Bay. In general, surface temperatures averaged 70° F. in most areas.

It was found that favorable trawling conditions exist at the following locations:

(1) Mexican border to Rosario River in 8 to 14 fathoms.

(2) Todos Santos Bay from a point beginning two miles south of the Ensenada anchorage and extending an additional 5 miles southward in waters of 7 to 13 fathoms.

(3) Colnett Bay in water of 5 to 13 fathoms. Snags are located about 1 mile south and 1 mile off the Mesa Alta shoreline. Kelp patches appear in this vicinity.

(4) San Quintin Bay--entire bay area appears to be flat and clear. San Quintin shoreline composed of extensive shoals; a shallow draft vessel is necessary to work this portion.

(5) Falsa Bay--small bay, approximately 2 miles in length. Trawling conditions apparently favorable, as 4-15 minute hauls were made without snagging.

(6) Playa Maria Bay--heavy concentration of seaweed in 6 fathoms of water. Best trawling outside of this depth, and probably good inside under calm conditions.

(7) Sebastian Viscaino Bay--scattered trawling starting at Morro de Santo Domingo, the northern extremity of the bay, indicated that ideal trawling conditions existed over most if not all of the extensive shoreline.

(8) Black Warrior Lagoon--trawling possible in channel areas; however, slack tide is best because swift currents are constant during flood and ebb tides. Small vessels, or shallow draft vessels could operate in the side bays, or on flats adjacent to channels. Sting rays are very abundant in shallow areas.

Snags were encountered at (1) Colnett Bay; (2) Seven miles SE. of Punta Bunda--or 31°40' latitude, 116°40'15" longitude; and (3) Six miles SE. of Santo Domingo River, 2 miles offshore (30°37' 15" latitude, 116°4' longitude).

An excellent anchorage is available in Black Warrior Lagoon, but the entrance channel must be negotiated with caution.

* * * * *

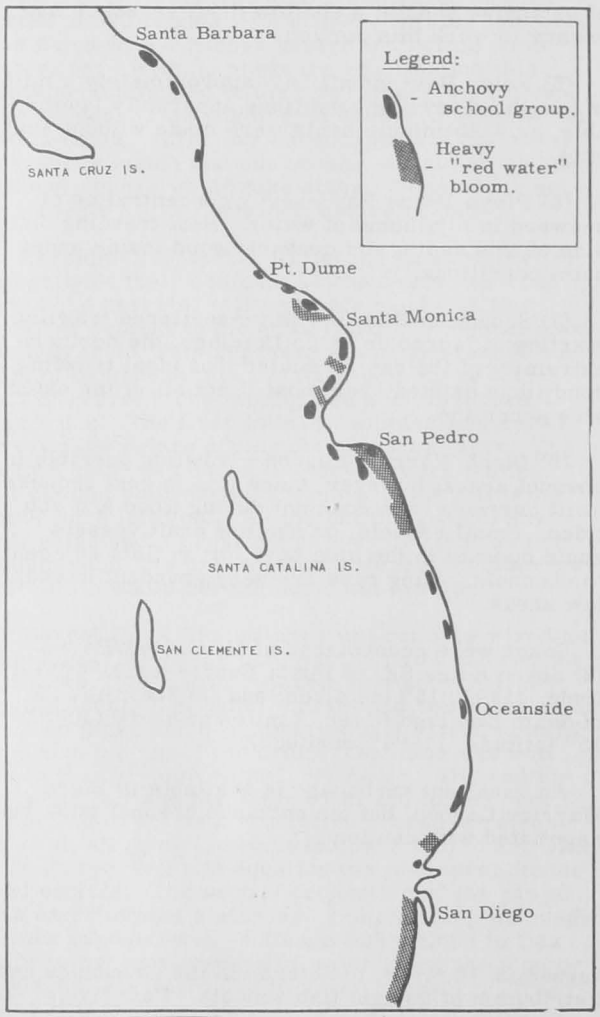
PELAGIC FISH DISTRIBUTION AND ABUNDANCE OFF SOUTHERN CALIFORNIA SURVEYED: Airplane Spotting Flight 58-14: The inshore area from the Mexican border to Point Conception was surveyed by the California Department of Fish and Game airplane spotting flight 58-14 between August 15-18, 1958, to determine the abundance and distribution of pelagic fish schools. Fair flying conditions prevailed on August 15 and 18, but low clouds and fog made it impossible to fly on the 17th.

PELAGIC FISH: In general, pelagic fish schools were not as plentiful as during preceding months.

Small school groups of anchovies were present from San Clemente to San Diego, and many large "breezing" schools of anchovies were seen off Los Angeles Harbor and in Santa Monica Bay. It was difficult to make an accurate count of these schools because they would alternately appear on the surface for varying periods of time and then disappear from sight. These schools were moving fast and changing shape rapidly, apparently being harrassed by bonito and/or barracuda which were reported to be heavily concentrated in the Los Angeles-Santa Monica area.

With the exception of one group of 40 schools of anchovies observed close to shore near Santa Barbara, no concentration of fish was apparent north of Point Dume.

The large "breezing" schools seen off southern California were positively identified as anchovies, and the other scattered schools observed during the flight were quite close to shore and exhibited characteristics and behavior very typical of anchovy schools.



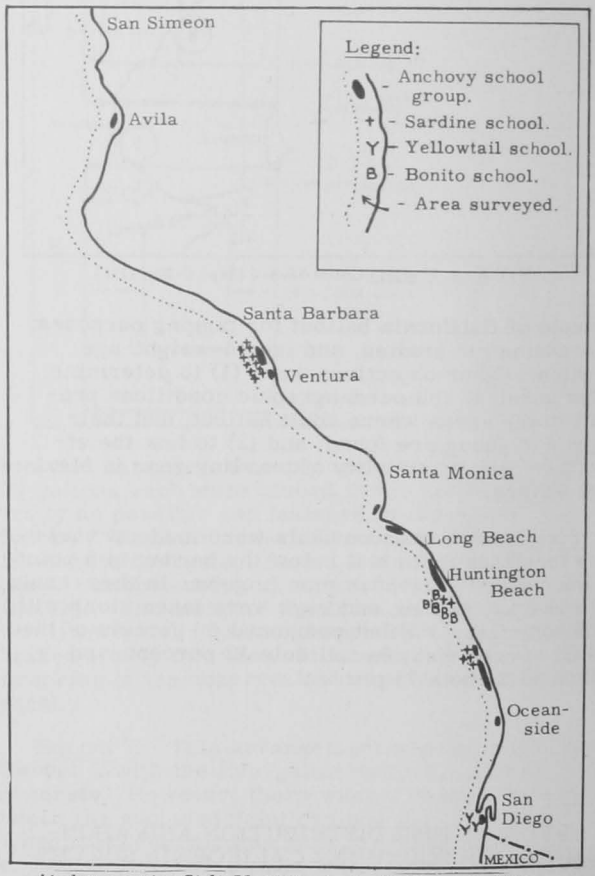
Airplane spotting flight 58-14 (August 15, 17, and 18, 1958).

During the August 15 flight, a total of 258 anchovy schools were sighted; on August 18, a total of 309 anchovy schools were sighted.

RED TIDE: The "red tide" which has persisted in southern California throughout most of the summer was still in evidence in some areas. Very heavy plankton "blooms," rusty-red in color, were present in Los Angeles-Long Beach Harbor, off Huntington Beach, La Jolla, and the Coronado Strand. The water in Santa Monica Bay was generally dirty with a few patches of red dinoflagellates. No heavy "red tide" was in evidence north of Point Dume.

The Los Angeles-Long Beach Harbor breakwater system had a definite confining effect on the organisms causing the red water. The entire harbor area from the shoreline to the outer harbor breakwaters was the color of "tomato soup." This discoloration stopped abruptly at the breakwaters and extended seaward only a short distance through the two channel openings and the open southeast end of the harbor.

Airplane Spotting Flight 58-16: The inshore area from San Diego to San Simeon was surveyed (Sept. 9-12, 1958) from the air by the California Department of Fish and Game Cessna "170" 1359D to determine the distribution and abundance of pelagic fish schools and to assess the intensity of



Airplane spotting flight 58-16 (September 9, 10 and 12, 1958).

shoreline fishing and clamming activity. Atmospheric conditions were generally favorable for aerial spotting during the three-day period of the survey.

PELAGIC FISH: No heavy concentration of anchovy or sardine schools was in evidence within the range of the flight, although moderate amounts of anchovies were present off San Onofre (200 schools), Huntington Beach (225 schools), Pitas Point (60 schools), and Avila (71 schools). In all four of the above areas, the schools were close to shore and motionless. Individuals within these schools seemed to be well dispersed and the schools were thin and ragged.

Seventy large, deep-swimming schools were seen during the three days, but species identification was not possible. Three schools of yellowtail were noted one to two miles off the Coronado Strand and about 10 schools of bonito were sighted between Laguna and the Newport breakwater.

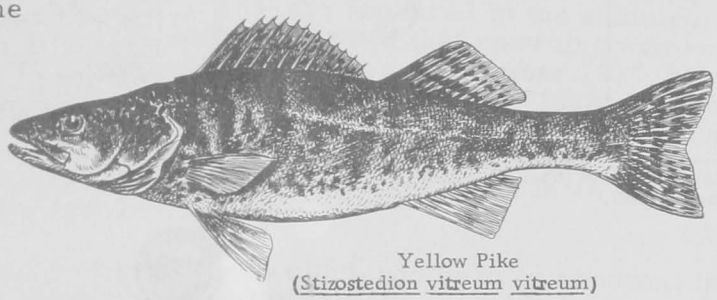
WATER CONDITIONS: "Red tide" was present south of Point Dume, with a particularly heavy outbreak observed between Redondo Beach and Malibu. Although reduced in intensity compared to August observations, red water still prevailed from Los Angeles-Long Beach Harbor to Newport Beach. Other areas of the coast were free from heavy concentrations of red water.

SHORELINE AND PIER SURVEY: A count of fishermen on piers and beaches and beach clammers was made from San Simeon to Point Arguello. As compared to earlier summer months, very little fishing activity was observed.

* * * * *

STOCKING OF STATE WATERS WITH YELLOW PIKE UNDER CONSIDERATION: A request to experiment with the introduction of fresh-water yellow pike (walleye) to two reservoirs in San Diego County was one of the highlights of a varied agenda at an October 23, 1958 meeting of the California Fish and Game Commission.

The yellow pike or walleye, the largest member of the perch family, is common in the Great Lakes and other eastern lakes. It ranges between 14-20 inches in length and occasionally reaches a length of 30 inches



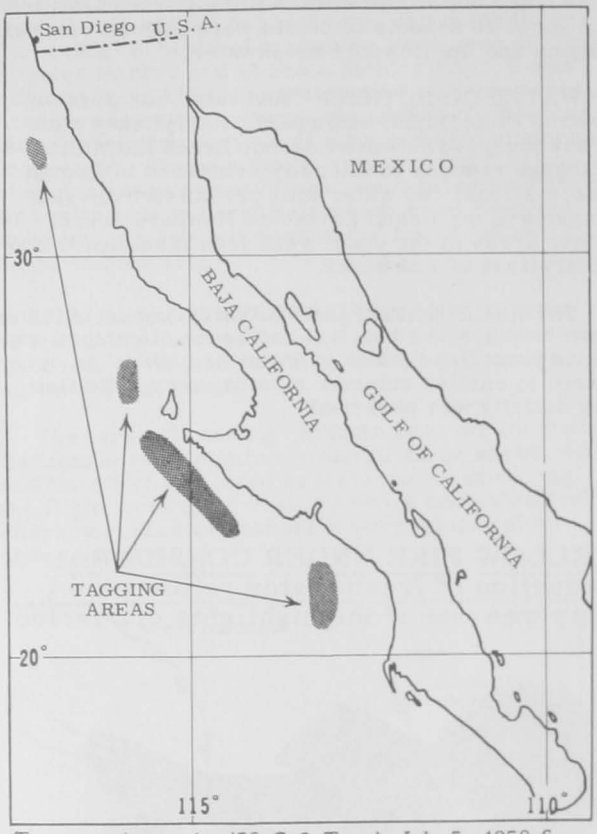
Yellow Pike
(Stizostedion vitreum vitreum)

The California Department of Fish and Game asked the Commission to approve the experimental introduction of yellow pike into San Vicente and El Capitan Reservoirs. The proposed project is to obtain eggs from the eastern lakes, fly them to California, and rear the fish to a size of $1\frac{1}{2}$ to 2 inches in southern California ponds. The Department says there is some doubt that yellow pike will reproduce in San Diego reservoirs, but explains there is no way of knowing for sure until they have been stocked.

The purpose of the experiment is to introduce a new predatory game fish that will prey upon small bluegills and threadfin shad, which are abundant in these reservoirs. The Department hopes the yellow pike will not only provide an additional fish to catch but will also reduce the numbers of bluegill enough to enable them to increase in size and thereby become a more desirable fish.

* * * * *

YELLOWFIN AND SKIPJACK TUNA TAGGED ALONG BAJA CALIFORNIA COAST (M/V Cape Beverly Cruise 58-C-2-Tuna): Fishing was conducted (July 5-September 8, 1958) along the outer coast of Baja California by biologists of the California Department of Fish and Game aboard the commercial tuna fishing vessel Cape Beverly. The purpose of this cruise was to tag yellowfin and skipjack tuna as part of population, growth, and migration studies; to collect and identify marine organisms associated with the tuna fishery; and to make limited oceanographic observations.



Tuna-tagging cruise (58-C-2-Tuna), July 5, 1958-September 8, 1958.

A total of 1,399 yellowfin and skipjack tuna were tagged with Type G, yellow, spaghetti tags and released off the Baja California coast.

The yellowfin tuna (450) were measured to the nearest one-half centimeter. Because the skipjack (949) unless returned to the water immediately suffer a heavy mortality rate, they were not measured. Six tagged yellowfin and seven skipjack had been captured and returned to the California State Fisheries Laboratory by other vessels prior to the return of the tagging team.

Marine organisms were collected at 21 different stations. Sea surface temperatures were taken at bait and fishing stations. Bait hauls were made in temperatures ranging from 62.3° to 70.1° F. The most successful hauls were made in the lower temperature ranges. Most of the bait consisted of northern anchovies, Engraulis mordax. The most successful catches of tuna were obtained in temperatures ranging from 72.1° to 78.6° F.

Cans--Shipments for Fishery Products, January-August 1958

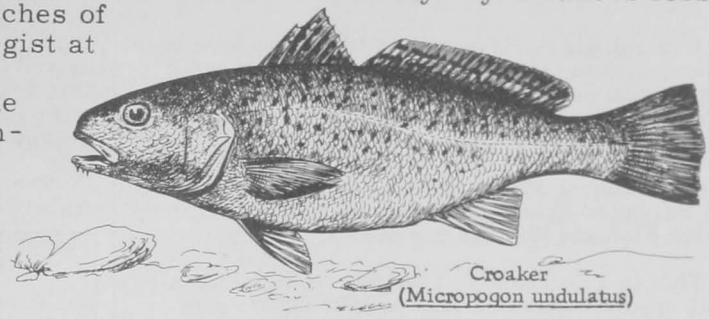
Total shipments of metal cans during January-August 1958 amounted to 78,678 short tons of steel (based on the amount of steel consumed in the manufacture of cans) as compared with 86,130 tons in the first eight months of 1957. Fish canning operations in August were about at an annual peak for salmon, Maine sardines, and tuna. The California sardine fishing season opened on August 1, and a pack twice that of 1957 was assured.

Note: Statistics cover all commercial and captive plants known to be producing metal cans. Reported in base boxes of steel consumed in the manufacture of cans, the data for fishery products are converted to tons of steel by using the factor: 23.0 base boxes of steel equal one short ton of steel.

Croakers

SCARCITY IN CHESAPEAKE BAY PREDICTED: Recent observations made by fishery biologists of the Virginia Fisheries Laboratory at Gloucester Point indicate that croakers will be scarce in Virginia for the next year or two. These scientists have been making extensive studies of croakers in Chesapeake Bay and York River since 1950.

"During 1958 trawl samples taken from the research vessel Pathfinder and samples collected from pound-net catches contained a larger percentage of older and larger croakers than were caught in 1956 or 1957. Scarcely any croakers less than a year old were present in catches of either gear," states a fishery biologist at the Laboratory. He also says that young croakers which hatched in the fall and winter of 1957 should normally be abundant in samples now. "Pinheads" (croakers about 4-6 inches long) return to the Bay after a winter in the Atlantic and often make up a large part of the catch the following summer.



Croaker
(Micropogon undulatus)

Believing that abundance of young croakers in the rivers would be an indication of the expected number of fish available to sport and commercial fishermen in later seasons, the biologists have been sampling young fish at 16 different stations from the mouth of Chesapeake Bay up into the fresh water of the Paumunkey River each month since April 1956. Prior to that time a staff biologist did extensive sampling over the same range.

In August 1958 large numbers of young croakers appeared in the samples. This was unusually early for them to be in the Bay and showed that spawning was unusually good. They were present in monthly samples through December 1957, but in January 1958 there was a serious decline in numbers and in April 1958 no young croakers were taken at all. In years prior to 1958 young-of-the-year croakers were not abundant before October, but were found throughout the York River all winter and the following spring. In May 1957, over 2,000 fish were taken in 16 samples, whereas, in May of 1958 only one croaker was taken.

The sudden disappearance of young croakers which had been so abundant in the fall of 1957 suggests that some catastrophe occurred in January 1958. Excessively cold water may have killed most of the young. The biologist reports that during the winter of 1957/58 water temperatures were lower and remained so for unusually long periods of time. Lowest temperatures recorded during the past winter were 36° F. in January and 34° F. in February. The lowest temperatures recorded for those two months prior to 1958 were 39° F. and 46° F.

Croakers spawn off Chesapeake Bay late in summer and continue spawning until early spring. It has been found that soon after spawning the young fish migrate up into the upper reaches of the river where they live during winter, spring, and summer. By the end of the first summer "pinhead" croakers migrating to the ocean are caught in pound nets. When they return to the Bay the following spring, they make up a large part of the commercial catch.

Fishery biologists believe that the success of the croaker fishery depends in large part on conditions prevailing in tributaries of Chesapeake Bay. Unfavorable temperatures, lack of food, diseases, or pollution may destroy large numbers of young. When nursery area conditions are at their best, large numbers of young survive, bringing good catches a year or two later.

Federal Aid Funds for Sport Fish and Wildlife Restoration Apportioned to States for Fiscal Year 1959

Federal Aid funds totaling $21 million have been apportioned to the States for their fish and game restoration programs for the year ending June 30, 1959, Assistant Secretary of the Interior Ross Lefler announced on November 2, 1958.

The Federal Aid program is administered by the Bureau of Sport Fisheries and Wildlife, United States Fish and Wildlife Service.

This is a decrease of $306,000 from the fiscal 1958 apportionment--a loss of $574,000 on game restoration and a gain of $268,000 for the restoration of fish. Game restoration funds for fiscal 1959 amount to $16.4 million; fish restoration funds, $4.6 million.

With this announcement came the Assistant Secretary's comment that in the apportionment to be made next year Alaska, as a State, will receive approximately $1 million as compared with the annual $165,000 it has been receiving as a Territory, a condition which will affect amounts to be distributed to individual states.

The Assistant Secretary pointed out also that the $21 million apportioned this year includes the fourth of five "backlog" allotments of $2,693,494 each. After the apportionment for 1960 this backlog money will have been distributed and the total amount available will be affected accordingly.

Federal Aid funds are derived from Federal excise taxes collected from the manufacturers--an 11-percent tax on sporting guns and ammunition for the restoration of game (Pittman-Robertson Act, approved September 2, 1937) and a 10-percent tax on fishing rods, reels, creels, and artificial lures, baits and flies (Dingell-Johnson Act, approved August 9, 1950).

The formulas upon which Federal Aid funds are distributed are prescribed by law and are based upon area and license holders. In the distribution of game restoration money, half of the amount is apportioned on the ratio of land area of a state to total area of all the states and half on the ratio of license holders. For fish restoration, land and water area is used for the distribution of 40 percent of the funds and 60 percent on license holders.

Maximum apportionment for each program is five percent of the total; minimums are one-half percent for game restoration and one percent for fish restoration.

In the 1959 distribution Texas and Michigan received maximum amounts for the restoration of game, $820,000 as compared with $848,700 which each received as maximum payments for fiscal 1958. California received $230,000, the maximum for restoration of fish, compared with the $216,600 it received in fiscal 1958. Minnesota, which received the maximum amount last year fell short of that goal in the 1959 distribution because its sales of fishing licenses did not increase to the same degree that sales did in several other states.

The minimum amount for game restoration for fiscal 1959 is $82,000, received by New Hampshire,

Apportionments of Federal Aid Funds to States for Sport Fish and Wildlife Restoration, Fiscal Year 1959

State	Sport Fishing	Wildlife
Alabama	$93,564.96	$294,312.60
Arizona	87,034.28	364,661.69
Arkansas	84,781.79	272,938.96
California	230,000.00	790,109.55
Colorado	105,618.57	436,366.14
Connecticut	46,000.00	82,000.00
Delaware	46,000.00	82,000.00
Florida	103,746.68	234,066.25
Georgia	91,363.77	268,940.64
Idaho	75,250.42	314,351.29
Illinois	147,339.34	456,468.32
Indiana	138,546.15	467,647.50
Iowa	84,192.81	363,288.85
Kansas	74,208.16	314,369.67
Kentucky	79,852.75	261,040.76
Louisiana	58,656.23	287,877.55
Maine	51,135.33	184,600.48
Maryland	46,000.00	112,772.63
Massachusetts	46,000.00	89,309.10
Michigan	209,575.76	820,000.00
Minnesota	221,163.25	528,593.75
Mississippi	53,362.20	239,443.84
Missouri	118,945.08	395,325.02
Montana	113,430.45	505,016.19
Nebraska	68,673.04	296,991.01
Nevada	67,715.81	317,059.03
New Hampshire	46,000.00	82,000.00
New Jersey	46,000.00	118,464.51
New Mexico	80,263.28	374,826.46
New York	145,847.54	695,907.06
North Carolina	84,223.59	339,779.61
North Dakota	48,588.95	250,404.53
Ohio	152,097.30	516,203.15
Oklahoma	92,294.82	284,221.35
Oregon	103,056.95	409,090.48
Pennsylvania	125,814.03	636,909.81
Rhode Island	46,000.00	82,000.00
South Carolina	54,509.59	174,101.39
South Dakota	59,244.37	295,569.58
Tennessee	114,702.57	338,451.29
Texas	207,027.78	820,000.00
Utah	69,482.47	319,329.75
Vermont	46,000.00	82,000.00
Virginia	77,320.23	327,671.34
Washington	94,074.96	338,035.45
West Virginia	46,000.00	219,196.71
Wisconsin	196,183.02	508,281.47
Wyoming	77,111.72	326,006.24
Hawaii	46,000.00	82,000.00

Rhode Island, Connecticut, Delaware, Vermont, and Hawaii. In 1958 the minimum was $84,870. For fish restoration the minimum for 1959 is $46,000 ($43,320 in 1958) and was received by Con-

necticut, Delaware, Maryland, New Hampshire, Massachusetts, New Jersey, Rhode Island, Vermont, West Virginia, and Hawaii. These same states received the minimum amounts for 1958.

Guam (which became eligible for Federal Aid in 1958), Puerto Rico, and the Virgin Islands each received $12,000 for game restoration programs and $10,000 each for fish restoration. Alaska has been receiving a statutory $90,000 for game programs and $75,000 for fish work. Hawaii has been receiving its funds on the regular State formula because of congressional action, July 2, 1956.

Federal Aid money must be matched by state money on the basis of $3 Federal Aid to $1 state funds, although in actual practice the states carry out all projects with their own funds, and are reimbursed for up to 75 percent of project costs.

To obtain the benefits of the Federal grants, the states submit project proposals to the Bureau of Sport Fisheries and Wildlife. Such proposals may consist of surveys, investigations, land acquisitions, land and water development, management of restoration areas, and maintenance of the completed projects. Acting for the Secretary of the Interior, the Bureau reviews these proposals to determine whether they are substantial in character and design, within the meaning of the Acts.

When Federal Aid projects are approved by the Bureau, the state fish and game departments proceed to carry out the plans, spending their own funds. The states then submit reimbursement claims for 75 percent of the costs of the project, either periodically or at the completion of the work. All equipment, lands, and structures become the property of the states. All project workers are hired by the states and are state employees.

Federal Purchases of Fishery Products

DEPARTMENT OF DEFENSE PURCHASES, JANUARY-SEPTEMBER 1958: Fresh and Frozen Fishery Products: For the use of the Armed Forces under the Department of Defense, 1.7 million pounds of fresh and frozen fishery products were bought in September by the Military Subsistence Market Centers--3.8 percent more than the preceding month and 4.3 percent more than in September 1957.

Table 1 - Fresh and Frozen Fishery Products Purchased by Military Subsistence Market Centers, September 1958 with Comparisons

QUANTITY			
June		Jan.-Sept.	
1958	1957	1958	1957
(1,000 Lbs.)			
1,679	1,610	17,875	18,715

For the first nine months of 1958 purchases of fresh and frozen fishery products totaled 17.9 million pounds, 4.5 percent less than in the same month of 1957.

Canned Fishery Products: Tuna was about the only canned fishery product bought for the use of the Armed Forces during September 1958. For the first nine months of 1958 canned fish purchases were about 5.4 million pounds--92.3 percent more than the same period of 1957. Purchases of canned tuna were up 166.3 percent for January-September 1958 as compared with the first nine months of 1957.

Table 2 - Canned Fishery Products Purchased by Military Subsistence Market Centers, September 1958 with Comparisons

Product	QUANTITY			
	June		Jan.-Sept.	
	1958	1957	1958	1957
	(1,000 Lbs.)			
Tuna	461	-	3,931	1,476
Salmon	1	211	1,402	1,220
Sardines	-	18	93	125

Fisheries Loan Fund

LOANS THROUGH OCTOBER 20, 1958: As of October 20, 1958, a total of 482 applications for fisheries loans totaling $17,228,290 had been received. Of these 260 ($6,924,252) were approved, 163 ($4,923,938) were declined, 36 ($1,564,126) were withdrawn, and 23 ($2,914,514) are pending. As several of the pending cases

have been deferred indefinitely at the request of the applicants and collections have been increasing, sufficient funds have been available to process all other applications when received. Funds are expected to be available to assure prompt handling of new applications.

The following loans have been approved between September 8, 1958, and October 20, 1958:

New England Area: Lester Falkingham, Beals, Me., $3,000; Boat Sea Ranger, New Bedford, Mass., $12,556; Nils Risdal, Fairhaven, Mass., $78,000.

South Atlantic and Gulf Area: Wendell H. McGill, Naples, Fla., $32,000; Isaac Daigle, Morgan City, La., $18,000.

California: American Tunaboat Association, San Diego, $100,000; Frank M. Perry, San Diego, $160,000.

Pacific Northwest: George T. Moskovita, Astoria, Oreg., $36,000.

Fishery Research Laboratory

NEW SHELLFISH LABORATORY TO BE BUILT ON CHESAPEAKE BAY: A new Federal shellfish research laboratory will be built at Oxford, Md., the U. S. Department of the Interior announced on October 2, 1958.

The site was selected by Interior's Bureau of Commercial Fisheries, after inspection of nearly 50 possible sites along the eastern shores of Chesapeake Bay. The site of about 13 acres was donated by Arthur J. Grymes, Jr., owner and manager of Tidewater Inn at Easton, Md. It is located on the outskirts of Oxford on Bachelor's Point at the junction of the Tred Avon and Choptank Rivers. The site has a 400-foot frontage on the Tred Avon River.

The initial projects of the laboratory will relate to oysters and soft-shell clams. The oyster projects will include work on the artificial propagation of that shellfish, causes for mortality, and a search for improved methods of obtaining seed oysters. The laboratory will consist of a building with the equipment necessary for the projects and several ponds which will be used in the study of oyster culture. Any research vessels attached to the laboratory will utilize a boat basin which will be dredged from the Tred Avon River.

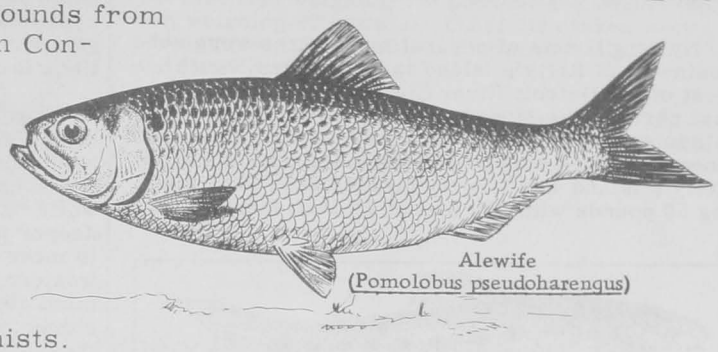
The site was selected because it was found that the salinity of the water there was right for oyster culture, the water was clean with no indications of pollution in the future, and there are few or no predators. The oyster drill and the starfish, master enemies of the oyster, are lacking entirely because of the brackishness of the water. A six-inch fresh-water line is on the edge of the property and electricity for lights and power is available.

Congress has made an initial appropriation of $180,000 for the construction of the laboratory. Work on the plans is proceeding and bids will be called for as soon as possible.

Great Lakes

INCREASE IN ALEWIFE POPULATION RAISES PROBLEMS: The sharp increase of alewife (Pomolobus pseudoharengus) in Lake Michigan and Lake Huron prompts the question: Is this the sign of a biological explosion?

Four years ago no mention was made of the alewife in Michigan statistical records. In 1957, 33,625 pounds of this so-called nuisance fish were taken from Lake Michigan and an additional 1,868 pounds from Lake Huron, according to Michigan Conservation Department reports.

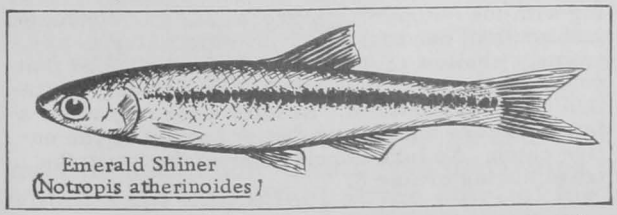

Alewife
(Pomolobus pseudoharengus)

A member of the herring family, the alewife came to the Great Lakes from salt water. To date it has little commercial value and its alarming increase in Michigan's waters is causing considerable concern among fishermen and conservationists. Not only is the fish a nuisance in the nets of the fishermen, but it seems to be taking the place of the valuable lake herring. As the alewife increases, the herring seems to decrease in almost the same proportion.

Concern is also being expressed over the presence in Lake Huron of the gizzard shad (Dorosoma cepedianum), another salt-water newcomer and another member of the herring family. Although the increase of the gizzard shad is not spectacular, its presence troubles fish biologists.

Great Lakes Fishery Investigations

SURVEY OF WESTERN LAKE ERIE FISH POPULATIONS CONTINUED BY M/V "CISCO:" Cruise 9: Trawling was continued during the September 9-22, 1958, cruise of the U. S. Bureau of Commercial Fisheries research vessel Cisco in 9 areas in the western basin of Lake Erie and one area in the central basin off Lorain, Ohio. Adult yellow perch and sheepshead continued to predominate among the larger fish in the catches. Young-of-the-year yellow perch, alewife, gizzard shad, sheepshead, and white bass were common to abundant in most of the catches. The young fish had attained the following approximate average total lengths in western Lake Erie: yellow perch, 3.7 inches; alewife, 3.9 inches; gizzard shad, 4.0 inches; sheepshead, 3.8 inches; and white bass, 3.2 inches. The latter two species, however, had wide length ranges. Smelt fry averaged about 2.6 inches. Other species taken commonly were carp, emerald shiner, spottail shiner, and trout-perch. Caught only occasionally were mooneye (only 1), adult smelt, white sucker, goldfish, silver chub, channel catfish (one large catch near South Bass Island), brown bullhead, stonecat, burbot, white bass adults, walleye (yellow pike), logperch, and fry of white crappie and black crappie.

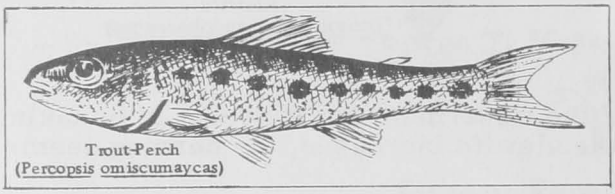

Emerald Shiner
(Notropis atherinoides)

Of special interest were changes in fish stocks and environmental conditions at the station off Lorain in the central basin. During the previous several cruises there has been a sharp thermocline just off the 10-fathom bottom with a scarcity of oxygen below the thermocline. Fish catches have been extremely small, consisting only of a few smelt, yellow perch, and sheepshead. When the station was visited during this cruise, however, the thermocline was not present, oxygen was plentiful at the bottom, and perch and fry of white bass and alewives were taken in very large numbers. Smaller quantities of several other species were also taken.

In a special study to obtain information regarding time of feeding of yellow perch, sheepshead, spottail shiners, and trout-perch, trawl hauls were made east of South Bass Island at 8:30 a.m., 12:00 noon, 3:30 p.m., and 10:00 p.m. The spottail shiners and trout-perch were preserved for future examination, but the yellow perch and sheepshead stomachs were examined aboard the Cisco. The percentage of stomachs of yellow perch older than

yearlings containing food at the various times were as follows: 8:30 a.m., 47 percent; 12:00 noon, 68 percent; 3:30 p.m., 54 percent; 10:00 p. m. 9 percent; indicating that during the study period the yellow perch fed mostly during the morning. The same was true of yearling yellow perch, but to a lesser degree. Most all young-of-the-year yellow perch had full stomachs in all collections. No definite changes were noted in the sheepshead stomachs.

Nylon gill nets of several mesh sizes were set southeast of Kelly's Island in $6\frac{1}{2}$ fathoms, southwest of the Detroit River Light in 3 fathoms, and just north of the Monroe entrance channel in 3 fathoms. All nets were "canned" so that their float lines were 6 feet below the surface. The catch off Kelly's Island was largely gizzard shad (61 weighing 50 pounds with 300 feet of $2\frac{1}{2}$-inch mesh). Three



Trout-Perch
(Percopsis omiscumaycas)

yellow pike (walleyes) and little else were taken off the Detroit River Light. The set off Monroe, which contained 600 feet each of $2\frac{1}{2}$- and $3\frac{1}{2}$-inch mesh, caught 80 perch, 17 yellow pike (walleyes), 31 carp, 22 gizzard shad, and a few sheepshead, alewives, goldfish, and channel catfish.

Shore-seining operations were carried out in one area near Sandusky, Ohio, and two areas near Monroe, Mich. Catches consisted mostly of young of the year of several species.

The water in Lake Erie continued to cool very slowly. Surface temperatures ranged from 18.4°-21.3° C. (65.1°-70.3° F.). There was no thermal stratification at any location visited.

Cruise 10: Trawling at the regular stations in western Lake Erie was continued during the September 30-October 13, 1958, cruise. Four of the areas designated as "index stations" were fished with trawls by the U. S. Bureau of Commercial Fisheries research vessels Cisco and Musky, and a 16-foot boat equipped with outboard motor, the latter confined to very shallow water. These areas, which are southwest of the Detroit River Light, southeast of the Toledo Harbor Light, east of Cedar Point, Ohio, and east of South Bass Island, have been worked in the same manner by the three boats twice previously this year. They will be worked systematically in future years in an attempt to gain enough information to follow annual fluctuations in fish stocks.

Trawl catches contained fewer adult sheepshead and young-of-the-year white bass and more adult smelt than similar catches made during the previous cruise. Apparently, the sheepshead and white bass have dispersed rather widely into the deeper portions of the lake. The smelt have begun to move westward into the cooling water of the western basin but not yet in large numbers. The most abundant species were yellow perch, emerald shiner, spottail shiner, trout-perch, and young-of-the-year sheepshead and alewife. Gizzard shad, smelt fry, white suckers, carp, goldfish, silver chub, channel catfish, brown bullhead, yellow pike (walleye), logperch, black crappie fry, and white crappie fry were less common. Single northern redhorse, stonecat, sauger, and rock bass fry were also captured.

Experimental nylon gill nets were set in 3 fathoms of water southwest of the Detroit River Light and $2\frac{1}{2}$ fathoms north of the Monroe entrance channel. The nets were "canned" so that their float lines were six feet below the surface. The catch was predominately yellow perch in the net off Monroe, 254 being taken in one 300-foot section of $2\frac{1}{2}$-inch mesh. In the set near the Detroit River Light the catch was largely young-of-the-year gizzard shad, taken mostly in the 2-inch mesh. Eleven walleyes (yellow pike) were taken in the two sets.

The water in western Lake Erie had cooled appreciably since the previous cruise, with the coldest recorded around river mouths. The temperature range was 13.0°-18.6° C. (55.4°-68.5° F.). No thermal stratification was observed.

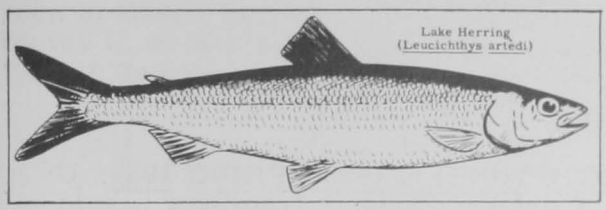
* * * * *

WESTERN LAKE SUPERIOR HERRING AND GENERAL FISHERY SURVEY CONTINUED (M/V Siscowet Cruise 6): The fishery and environmental study of Western Lake Superior was continued in the Apostle Island area by the U. S. Bureau of Commercial Fisheries research vessel Siscowet during cruise 6 (September 15-24, 1958). Six stations were visited during the cruise: (1) southeast of Michigan Island, (2) northwest of Madeline Island, (3) northwest of Sand Island, (4) south of Sand Island, (5) southeast of Madeline Island, and (6) northwest of Michigan Island. Sweeps were made with a special fish-magnifying fathometer at each station in an attempt to locate schools of lake herring. When a school of fish appeared on the fathometer, a gill net was set obliquely from the surface to the bottom. Bull nets 300 by 20 feet with $2\frac{3}{8}$- and $2\frac{1}{2}$-inch mesh were used. Plankton samples were collected at each station and trawling was done where possible.

Catches in trawl hauls were generally muddlers, ninespine sticklebacks, and young-of-the-year smelt. One 15-minute tow northwest of Sand Island in 30 fathoms took 94 chubs. Extensive trawling with the outboard-motorboat rig was conducted just south of Sand Island, where the water is extremely shallow (3-13 feet), and it was hoped that young-of-the-year lake herring or possibly whitefish could be captured. Results were negative--a few muddlers and johnny darters made up the entire catch. No lake herring were taken with the trawl during cruise 6.

Lake herring were taken in abundance with the bull nets southeast of Michigan Island and south-

Chubs and smelt were predominant in the set made northwest of Sand Island, with lesser catches of burbot and only 10 herring. The set northwest of Madeline Island was made to identify a large school



east of Madeline Island. These fish averaged 13 inches in length and nearly 10 ounces in weight. Other species taken in these nets were longnose suckers, burbot, smelt, lake trout, and chubs. of fish which appeared on the fish-magnifying fathometer. One 300-foot conventional gill net ($2\frac{1}{2}$-incn mesh) took 78 longnose suckers weighing 81 pounds.

The set northwest of Michigan Island was again made to identify large schools of fish which appeared on the fathometer. Five bull nets were set on the bottom which varied in depth from 36 to 150 feet. The catch was predominately longnose suckers (226 fish weighing 259 pounds) and burbot (64 fish weighing 29 pounds). Other fish taken were herring (14), smelt (43), menominee whitefish (13), and lake trout (5).

Surface temperatures ranged from 54.5° F. at the station northwest of Madeline to 59.0° F. southeast of Madeline. Bottom temperatures remained at about 40° F.

Inspection for Fishery Products

U. S. BUREAU OF COMMERCIAL FISHERIES PROGRAM IN FULL SWING: It is estimated that an average of over one-third million pounds of fishery products a day is produced under the continuous inspection of Government fishery inspectors supplied by the U. S. Bureau of Commercial Fisheries. The inspection staff is combining the grading and inspection experience of the Agricultural Marketing Service (A. M. S.) and the commercial fisheries experience of the Bureau of Commercial Fisheries. When the latter Bureau assumed responsibility for the fishery inspection services on July 1 of this year, it took over several experienced agricultural fishery plant inspectors. Furthermore, the A. M. S. officials have been quite helpful with advice and suggestions based on their years of grading and inspecting food products.

The Bureau of Commercial Fisheries inspection service now has 20 inspectors and 2 field supervisors; another supervisor is to be added in the near future. Sixteen seafood processing plants are now operating under the continuous inspection of Bureau personnel. Essentially all of the production of these plants can now bear the certification that it was "produced under continuous government inspection" and satisfied the requirements of the inspection service. Furthermore, most of the breaded shrimp, fish sticks, and fish blocks produced can also bear the official "U. S. Grade A" or "U. S. Grade B" shields. Only three products can now use the grade shields because so far there are only three official grade standards for fishery products. The Government and industry are now working actively to develop additional standards. Two, those for haddock fillets and halibut steaks, may be official by the first of next year. Although only three products are now graded, something like 75 different fishery products are prepared under continuous inspection.

In addition to the 16 plants having continuous inspection, another 15 or 20 firms have on one or more occasions employed the Government inspectors to inspect and grade specific lots of fishery products. Although the packages in these lots can not be imprinted with a "U. S. Grade" shield or with a "continuously inspected" shield, they can indicate that they have been lot-graded and certificates covering the inspection and grading results can be supplied buyers and sellers.

Maine Sardines

STUDY INDICATES SALES EXCEED IMPORTED BY A WIDE MARGIN: Sardines canned in Maine are currently outselling imported brands by a ratio of 8 cans to 2 and the California type by 8 cans to 1 in the United States market, according to survey data released by the Maine Sardine Council on October 17, 1958. The survey was made by a national research organization employed by the Council.

The survey also revealed that Maine has 68 percent of the market in can volume as compared with 21 percent for imported packs and 11 percent for the California sardine.

The Maine industry's sales had been showing a steady gain for the past 12 months and much of this was attributed to the mandatory State-grading program which went into effect at the start of the present season. Voluntary grading had been in operation for the previous three years and this has also been a major factor.

The grading program is under the direction of the Maine State Department of Agriculture and is designed to improve the over-all quality and merchandising of the State's sardine pack

Marketing

EDIBLE FISHERY PRODUCTS PROSPECTS WINTER 1958-SPRING 1959: United States civilian per capita consumption of fishery products from now to mid-spring 1959 is expected to be a little above the year-earlier rate. The prospective increase will be in the canned items; use of the fresh and frozen products will likely differ little. Retail prices of fishery products may be close to those of a year earlier, though some easing in prices of canned fish could occur because of heavier supplies.

Prospects are for somewhat more edible fishery products to be available from fall to spring this season than last. Supplies of frozen fishery products in the continental United States are expected to be about the same as a year earlier, but those of the fresh products will be seasonally low until the new catch season begins next spring. More canned fishery products than a year ago will be available in the next several months because of the larger packs of salmon, tuna, and sardines. Output of canned tuna may set a record this year. The pack of California sardines (pilchards) may be the largest in several years, but that of Maine sardines is smaller than in 1957. As usual, imports will supplement domestic production of canned fishery products, though maybe not to the extent that they did in the past year.

Exports of fishery products during the next several months may be somewhat greater than a year ago. Canned salmon and California sardines are the major items among the fishery products we usually export, and our supplies of these two items will be larger in the months ahead. The United Kingdom recently removed restrictions on imports of canned salmon from the United States and Canada. The restrictions had been imposed in the late 1940's to conserve dollar resources.

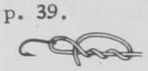
This analysis appeared in a report prepared by the Agricultural Marketing Service, U. S. Department of Agriculture, in cooperation with the Bureau of Commercial Fisheries, U. S. Department of the Interior, and published in the former agency's November 5, 1958, release of The National Food Situation (NFS-86).

North Atlantic Fisheries and Gear Research

EXPLORATORY TRAWLING FOR COMMERCIAL QUANTITIES OF SAND LAUNCE CONTINUED (M/V Delaware Cruise 58-6): In order to find out about the commercial potential of sand launce (sand eel), the second in a series of cruises off the New England coast was made October 22-30, 1958, by the exploratory fishing vessel Delaware of the U. S. Bureau of Commercial Fisheries. The commercial potential for industrial fishing on this species in the New England area is unknown at the present time, though an extensive fishery exists for this species in the North Sea.

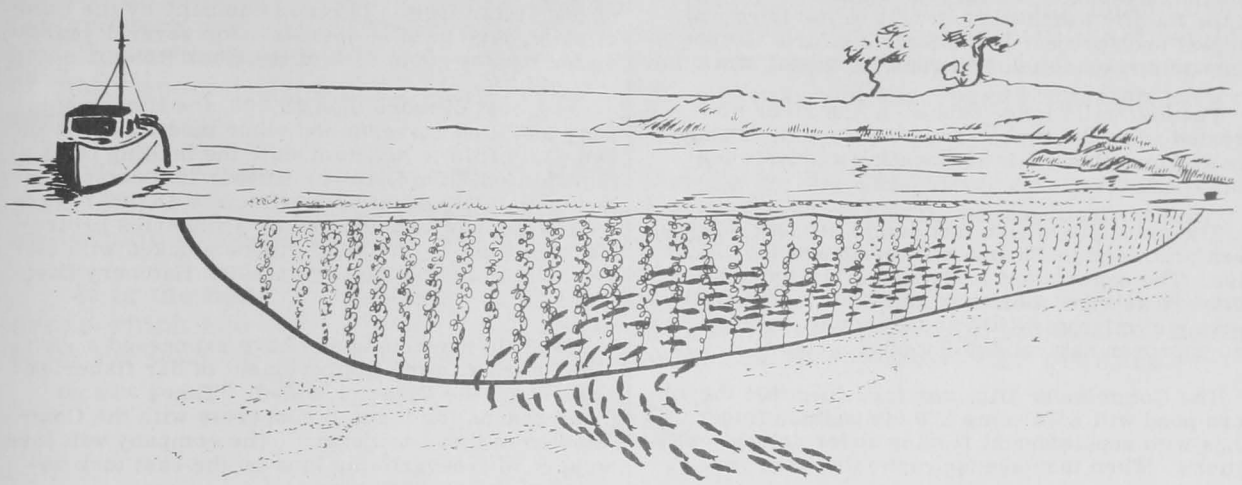
Experimental trawling was conducted in cooperation with local fishermen in the Point Judith, R. I., area. Coordinated trawling between the Delaware and a commercial trawler was done, each vessel being equipped with a 100-foot Holland sand launce trawl of a type identical to that now being used in Europe.

Note: See Commercial Fisheries Review, August 1958 p. 39.



North Atlantic Herring Research

AIR-BUBBLE CURTAIN DIRECTS SARDINES INTO SEINE SUCCESSFULLY: Promising seine catches of sardines (herring), were made by commercial fishermen in Casco Bay, Me., with the aid of the compressed air-bubble curtain developed by the U. S. Bureau of Commercial Fisheries North Atlantic Herring Research Station at Boothbay Harbor. Tests were first conducted on the air-bubble curtain in



Air-bubble curtain diverts and guides fish.

the late summer and fall of 1957. During September 1958 commercial fishermen and Bureau personnel operated cooperatively to demonstrate that the air-bubble curtain can be employed to direct sardines from deep water into areas accessible to seine gear. Catches of 1,000 and 3,000 bushels were made when the air curtain was set in conjunction with a seine. The curtain of air bubbles extended from the shore to the middle of the channel, and diverted fish into the seine that would otherwise have been inaccessible to any kind of net. Later the offshore end of the air curtain was towed ashore sweeping in fish remaining between it and the shoreline.

Maine sardines this year have not been readily available for capture by standard procedures. Through use of the air-bubble curtain, at an estimated total installation cost of $4,000 per vessel, one operator stated he could recover this entire cost (ex-vessel price of sardines about $1 a bushel) in one set of his seine.

Note: Also see Commercial Fisheries Review for December 1957 pp. 28-29 and January 1958 pp. 40-41.

* * * * *

HERRING LARVAE SOUGHT IN GULF OF MAINE-GEORGES BANK AREA (M/V Delaware Cruise 58-5): The purpose of the cruise was to locate and measure the extent of spawning on the offshore spawning grounds of sea herring (Clupea harengus) and to sample the newly-hatched herring larvae.

On October 14, 1958, the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware completed a 1,391-mile offshore plankton and oceanographic cruise in the Gulf of Maine-Georges Bank area. A total of 34 oblique one-meter plankton tows were made at designated stations, 408 drift bottles were released, 76 salinity samples were collected, and 156 bathythermograph casts were made during the nine-day cruise. Hardy plankton recorders were towed over the entire cruise line.

Oregon

THIRD EXPERIMENTAL PROJECT ESTABLISHED FOR REARING SALMON UNDER NATURAL CONDITIONS: Construction of an experimental natural "fish farm" for salmon on the east fork of the Millicoma River in Coos County was announced on October 3, 1958, jointly by the Oregon Fish Commission and one of the largest timber companies in the Pacific Northwest. It will be the third and largest such project in the State's efforts to supplement and establish fish runs in coastal streams.

The half-mile long "oxbow" in the river was created when the timber company recently changed the original channel in re-locating a private logging road.

The principle of fish farming is not new, having been practiced in Europe and the Orient for centuries. The experiment in Oregon is designed to compare relative merits of artificial feeding and raising of migratory fish in hatcheries with the as-yet-unproven natural holding pond methods.

The Commission Director explained that the 10-acre pond will hold some 500,000 salmon fingerlings with supplemental feeding under natural conditions. When they are approximately one year of age, the fish will be released from the pond into the river to pursue their ocean-bound course.

The experiments are designed to lower current costs of raising fish in hatcheries by placing fingerlings in impounded waters with a natural food supply. Three ponds leased for the consideration of one dollar from a plywood company by the Commission have been in operation for several years on the nearby south fork of the Coos River.

At a cost of more than $5,000, the timber company installed culverts and other modifications in two earth fills to accommodate the holding pond. "In addition," the Director stated, "the company has voluntarily spent approximately $8,000 to modify the new channel bed as a fisheries protection measure." The pond will be stocked with silver salmon fry by the Commission Hatchery Division.

"The timber companies have expressed a genuine interest in the improvement of our fisheries resource," the Director added. "There was no other reason for them to cooperate with the Commission in these projects." The company will lose an acre of tree-growing land on the east fork because of the rearing pond.

Oysters

STANDARDS OF IDENTITY RESEARCH PROGRAM INITIATED FOR SHUCKED OYSTERS: A Steering Committee--composed of a representative from each of the three cooperating organizations, Oyster Institute of North America, U. S. Food and Drug Administration, and U. S. Bureau of Commercial Fisheries--has made progress toward establishing the basis for a joint study for future standards of identity of shucked oysters.

A number of meetings have been held to select a site for the work and a Director for the program. Efforts were made to formulate the aims of the investigations and to outline, where possible, specific projects.

It was agreed that there will be three research workers. Each of the organizations will be responsible for the financing of one of the scientists.

The laboratory work will be centered at the Virginia Fisheries Laboratory, Gloucester Point, Va. Excellent facilities are being made available there for these studies. This is almost an ideal location for the research work. There are many oyster plants within a radius of 25 miles and there are oyster beds in the York River close by the laboratory.

Studies of washing, blowing, etc., will be made in plants in various parts of the Chesapeake Bay. Packers will be asked to make available space in their plants from time to time. Also oysters will be requested to be used in the studies.

The industry has agreed to supply plant space for tests, and oysters on which the tests can be made both in the plant and in the laboratory.

The oyster industry for the first time in modern history has an opportunity to become an equal partner to develop the basis for standards which will be sound, fair, and practical.

* * * * *

SURVIVAL OF 1958 LONG ISLAND SOUND OYSTER SET QUESTIONABLE: In August of 1958 there were indications that nature had been kind to Long Island oyster growers and that a general set had been obtained. Survival of such a set would have brought about a recovery in production, which was down substantially because of many successive set failures, disastrous storms, and the recent starfish invasion.

The optimism was short-lived due to attacks by the 1957 crop of starfish. Constant mopping and suction dredging on the limited grounds still being farmed were inadequate to repel the invading starfish hordes.

It is the hope of the oyster industry that the Long Island growers may find some areas which are free of starfish to which the new set can be transplanted. This seems to be the only recourse open to the Connecticut and New York oyster growers.

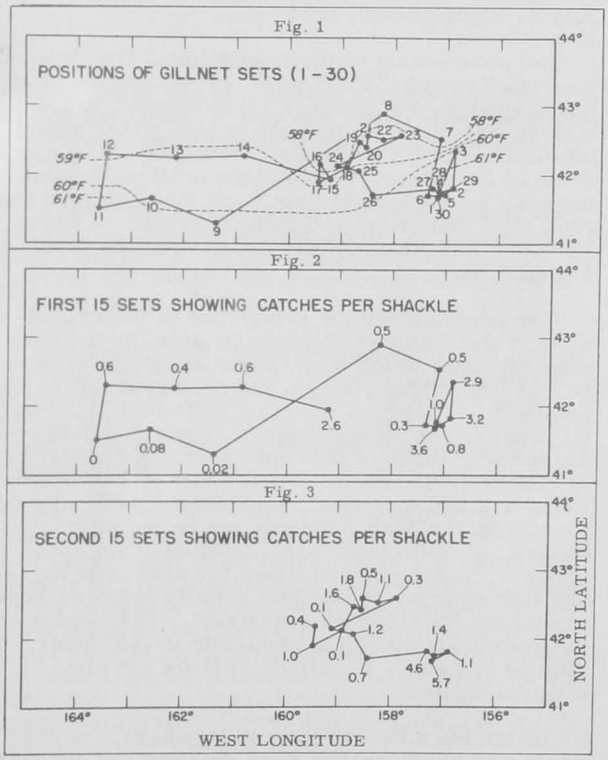
Pacific Oceanic Fishery Investigations

ALBACORE TUNA FISHING WITH GILL NETS AND TROLLING GEAR TESTED BY M/V "PARAGON": Studies to determine the feasibility of fishing albacore tuna with gill nets supplemented with trolling gear were conducted (July 26-August 30, 1958) by the U. S. Bureau of Commercial Fisheries chartered vessel Paragon.

Grounds Fished: Effort was expended primarily on two grounds. The first centered around 41°40' N., 157 11' W. and 6 sets were made in and around this position from July 26 to July 31 (fig. 1). With the failure of this area, which was on the warm (62° F.) side of a temperature front, sets 7 and 8 were made in the cold (57° F.) water to the north and northwest. Exploration was then extended westward with sets 9 through 14 and culminated in set 15 (fig. 2). Ten sets were made in this second area, which showed promise. Expectations were not realized and the remaining 5 sets were made en route to and in the first area fished (fig. 3).

Albacore Gill-Net Catches: The total catch from 30 sets of gill nets, comprised of 40 shackles, was 1,617 fish; of these 1.0 percent (17) were lost during retrieving and 5.8 percent (94) were shark-damaged. The weight of fish placed in the hold was estimated at 26,532 pounds. The average catch per shackle for all 30 sets was 0.6 with extremes of 0 to 5.7. The first area fished was the more productive yielding half the total tonnage in 5 sets.

Albacore Troll Catches: Ignoring a few fish taken en route to and from the above area (fig. 1), 212 fish were taken in conjunction with gill-net sets. This represented 1.1 fish per hour within 194½ hours trolled and 1.5 fish per 10 line hours within 1,421 line hours trolled. Individual catches ranged from 0-7.4 per hour during a given day. Total weight was estimated at 2,938 pounds.



M/V Paragon cruise (July 26-August 30, 1958).

Other Fishes Taken: Seventeen black tuna, Thunnus orientalis, were captured in the nets and all, estimated at 435 pounds, were placed in the hold. Most of these were small fish averaging about 15

pounds each, but one large fish was taken estimated at 195 pounds. Eighteen broadbill swordfish, Xiphias gladius, were captured, but two were lost in attempting to board them. An estimated ton was placed in the hold. Sharks varied in catch as much as albacore, but not necessarily within sets. A total of 2,026 shark, mostly great blue shark, Prionace glauca, was taken in the 30 sets. This represented an average of 1.7 per shackle with extremes of 0.3-5.4 per shackle.

Temperature, Secchi Disc Measurements: The average temperature fished for albacore was 60.1° F. with extremes of 57.4° F.-64.0° F. Greatest success was had generally in the upper and the poorest in the lower portion of this range. The surface temperature front shown in figure 1 was located 2° to 3° south of its normal position dur- July and August. Thirty bathythermograph lowerings to 180 feet were made. All but one were at gill-net stations; the lowering at station 2 was omitted. Each was accompanied by Secchi disc readings. The average depth of the readings was 9 fathoms with extremes of $6\frac{1}{2}$ to 11 fathoms.

Night Light and Daylight Surface Observations: A 100-watt bulb extending about 1 foot from the ship and 10 feet above the water was turned on for a period of 30 minutes to one hour during darkness following the setting of the nets. The general absence of organisms under the light was striking. A close watch was kept during daylight hours to record the presence of life in the surface water. Although whales, seals, birds, and scattered sunfish were not uncommon, smaller organisms such as saury, vellela, and pelagic barnacles were rarely seen.

Weather: Conditions were generally good for setting the nets and only three days were lost because of bad weather.

* * * * *

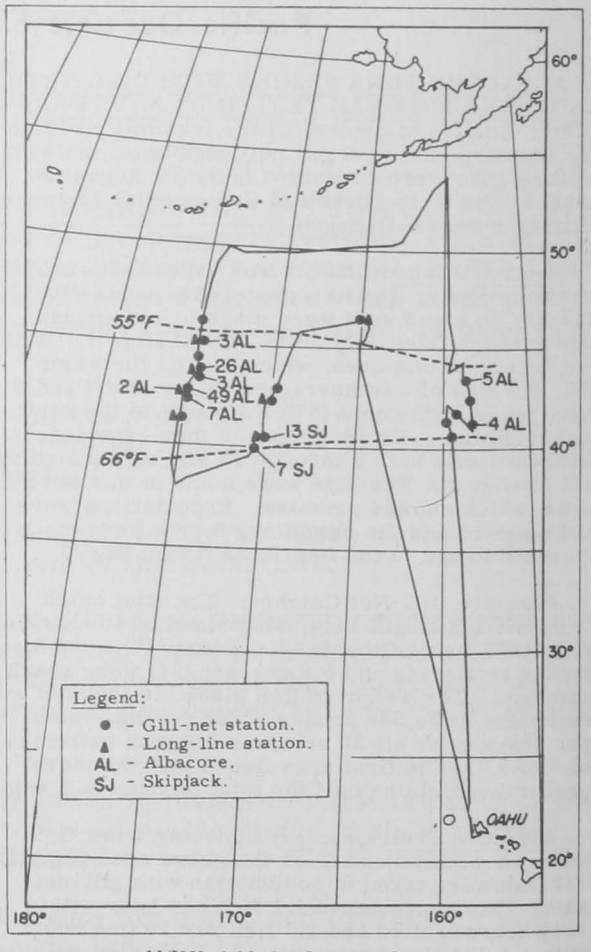
CENTRAL NORTH PACIFIC ALBACORE TUNA OCEANOGRAPHIC, AND PLANKTON SURVEYS (M/V Hugh M. Smith Cruise 46): An oceanographic and plankton survey and albacore fishing with troll ing, gill-net, and long-line gear in the central nortl Pacific area were conducted by the U. S. Bureau of Commercial Fisheries Pacific Oceanic Fishery Investigations research vessel Hugh M. Smith from July 21-September 9, 1958.

The observation at the International Geophysical Year station at 21°11' N., 158°19' W. consisted of two oceanographic casts; a 15-bottle cast to 1,400 meters was made at the time of high water at Honolulu Harbor and a 10-bottle cast to 500 meters was made at low water. Two oblique 0-60 meter plankton tows with a 1-meter net were made at 2300 and 2330 local zone time and bathythermograph casts were made at 1-hour intervals between the oceanographic casts.

The program for the remainder of the cruise was divided into two phases. Outside the primary albacore area which was defined roughly by the 66°-55° F. surface temperatures, the program was limited to data which would be sufficient to permit the comparison of oceanographic and plankton conditions with those of previous years. Oceanographic observations consisted primarily of 13-bottle casts to 1,200 meters at approximately 90-mile intervals on the N.-S. transect and bathythermograph casts at 30-mile intervals. Samples from each bottle were analyzed on board for dissolved oxygen and inorganic phosphate and salinity samples were preserved for laboratory analysis. The biological program consisted of a 30-minute 0-140 meter oblique tow and a 30-minute surface tow and incidental trolling.

Inside the albacore tuna survey area, the program was considerably more detailed and observations were more closely spaced. The 55°-66° F. temperature band was farther south than was anticipated. Instead of the 42°-48° N. limits given in the cruise plan the area was actually between 39°30' N. and 46°30' N.

Within the area 13-bottle casts to a depth of 1,200 meters were made at intervals of not greater than 60 miles on the N.-S. transects and bathythermograph casts were made at approximately 15-mile intervals and before and after gill-net and long-line sets. Oceanographic casts were made on either side and bathythermograph casts were made at 1-mile intervals across a tempera-



M/V Hugh M. Smith cruise 46.

ture front centered at 41°30' N., 175°07' W. The temperature change in the front was from 61.5° F. to 63.5° F. in 4 miles.

Nineteen gill-net sets consisting of 10 shackles of $4\frac{1}{2}$" to $7\frac{1}{2}$" mesh net each were made at surface temperatures between 53.0° F. and 65.7° F. Albacore were taken in only 7 of the sets and the total catch was only 97 fish. The best catches were 49 at the station at 42°47' N., 175°08' W. and 26 at 43°29' N., 174°48' W. Repeat sets at these stations yielded only 7 and 3, respectively. The catches at the other three stations were 3, 4, and 5. Twenty skipjack (13 at one and 7 at the other) were taken in the two southernmost sets along 170° W. Other catches were 194 sharks, mostly great blue, a few bramids, boarfish, squid, and two fur seals in the set at 46°34' N., 164°44' W.

Seven sets of the surface long-line gear were made. All sets either preceded or followed a gill-net set. Each set consisted of 20 baskets of 12-hook gear having a buoy on each dropper so that the depth at which each hook fished depended solely on the dropper length. Each basket had 3-12 ft., 3-24 ft., 3-48 ft., and 3-96 ft. droppers. Only two albacore were taken, one on a 24-ft. and one on a 48-ft. dropper at the station at 42°48' N., 175°08' W. A total of 226 sharks (221 great blue, 4 mackerel, and 1 mako) were taken; the largest single station shark catch was 66 great blues at 42°13' N., 170°11' W. Two alepisaurus were the only other fish taken.

Trolling was also very unproductive. Except for the run back to Honolulu five lines were trolled at approximately 6.5 knots during all daylight runs in waters having surface temperatures between 52° F. and 72° F. but only 13 albacore were taken. Although the vessel circled after each strike, they were taken individually except for two catches of 2 fish each. Only three of the albacore were tagged and released. Only one albacore school was sighted during the cruise--at 45°08' N., 174°47' W. while patrolling a long-line set. Although three albacore had been taken the night before in a gill-net set in the area, none was taken on the long-line set or the trolling lines.

Twenty-nine 0-140 meter oblique and 25 surface plankton hauls were made with the 1-meter net, and seven surface hauls were made with the 45-cm. net. Five of the latter were made across the front centered at 41°30' N., 175°07' W.

Settled volume estimates of the 1-meter net hauls made in the field revealed a marked east-west change in both the content and volume of the samples from the eastern and western limits of the albacore survey areas. For example along 160° W. longitude the 140-meter hauls averaged 280 cc. (range 135-360 cc.) and were composed of a mixture of euphausids, chaetognaths, and coelenterates and had no concentration of crustacea. Along 170° W. longitude the 0-140 m. hauls averaged 600 cc. (range 300-1200 cc.) and were mostly euphausids and calanus.

* * * * *

MARQUESAN SARDINE REPRODUCES IN HAWAIIAN WATERS: In 1955 the Pacific Oceanic Fishery Investigations (POFI) began introducing a sardine from oceanic waters near the Marquesas Islands into those near the Hawaiian Island of Oahu. Plants were made at the end of seven research cruises, with numbers ranging from 3,000 to 53,000. The most recent release was on June 23, 1958.

The scientists and fishermen found that these small fish of the herring family are abundant in the Marquesas and are very good bait for tunas. The releases into waters around Oahu were made in the hope that these sardines would spawn and thus augment the presently insufficient supply of bait for the local skipjack fishery.

Through the cooperation of commercial fishermen, there have been several recoveries of these introduced fish. Until the fall of 1958, these recoveries were all from waters near Oahu, the general area of the plantings. Recently, fishermen seining for bait near the islands of Kauai and Maui caught numbers of the Marquesan sardines. Although some of these recoveries could have been from recent releases, the small size of most of them is definite evidence that these Marquesan sardines have found Hawaiian waters to their liking and have successfully spawned.

Whether the sardine will become abundant enough to be economically significant should be answered in the next two or three years. If it does become abundant, the tuna bait supply in the islands might be doubled or tripled, for the sardine seems to prefer sandy, rocky beaches rather than the slightly brackish bays generally utilized by the local nehu.

Even more significant is the hardiness of the sardine as contrasted with the delicate nehu. Properly handled, the sardine can withstand long ocean voyages and would permit Hawaiian fishermen to venture farther afield.

Additional benefits might accrue to reef fishermen for the sardine will augment the food supply of such fish as "ulua," opening the way to larger populations. In effect the sardine will convert zooplankton drifting by the islands into usable form for game fishes.

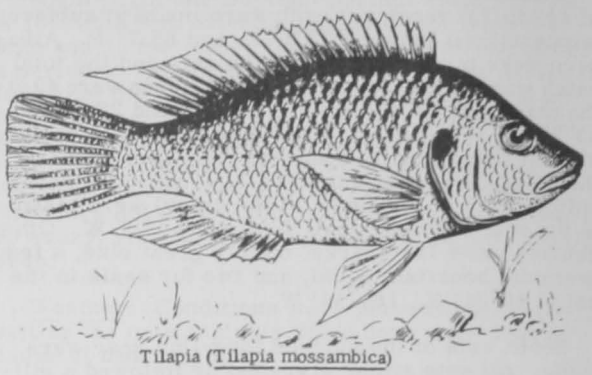
Aside from the commercial implications, the introduction represents an interesting zoogeographical experiment. The fish fauna of the Hawaiian Islands is poor in species compared to island groups to the southwest. Some authorities argue that the great distance to Hawaii is the controlling element. Others argue that suitable habitats for many species are absent here. Introduction circumvents the distance factor, and the early success of the transplanted sardine indicates that distance was the reason for its absence here.

Of additional interest is the fact that the introduction of the sardine to Hawaii is the first known instance of successful transplanting of a purely marine species of fish.

* * * * *

SECOND TILAPIA BAIT-REARING PROJECT INITIATED: As a result of the success obtained by U. S. Bureau of Commercial Fisheries biologists with the commercial pilot-plant tilapia tuna-bait rearing project at Paia on the Island of Maui, an experimental tilapia rearing plant was established at POFI's Kewalo docksite headquarters in August 1958 to investigate the effects of various diets on the rate of production of young and the effects of various sex ratios also on the rate of production of young. This plant produced about 54,000 young fish in September, and the results already obtained relate in an interesting way to the various factors being tested. Sex ratios of 1:2 and 1:3 (males to females) have been highly productive, whereas ratios of 1:4 and 1:6 were not. In addition, concentrations of 30 and 50 adult fish per tank of about 50 square feet bottom area produced many more young than 70 or 90 fish per tank. Of the three feeds being tested, one appeared much better in terms of young fish being produced than the other two.

While conclusions based only on a single month's operation can hardly be considered final, nevertheless these results indicate that the experimental design is sound and that the variables being investigated are of real significance in the design of any commercial tilapia bait-rearing project. It is of interest that the particular sex ratios chosen for the Paia plant, a ratio of 3 females per male, seems

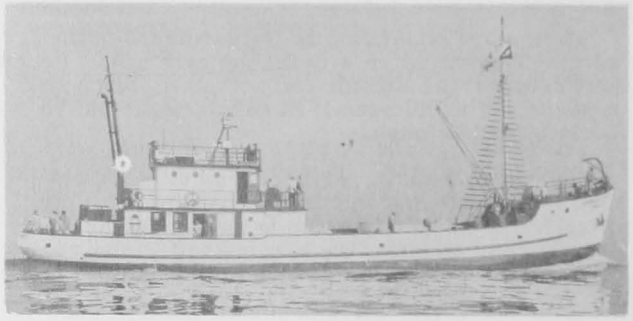


Tilapia (Tilapia mossambica)

to be one of the better ratios as indicated by the Kewalo experiments. Additionally, the food chosen for the fish at the Paia plant seems to be one of the better foods insofar as giving a high production of young fish.

* * * * *

SKIPJACK TUNA BEHAVIOR STUDIES PROVIDE A POSSIBLE KEY TO NEW FISHING METHODS (M/V Charles H. Gilbert Cruise 41): The U. S. Bureau of Commercial Fisheries' research vessel Charles H. Gilbert returned to Honolulu on September 27 after completing a 52-day cruise in Hawaiian waters, according to the Director of the Pacific Oceanic Fishery Investigations. The cruise



The Service's research vessel Charles H. Gilbert.

was designed to study the behavior of skipjack, also known as aku in Hawaii, in their natural environment, and measure certain variables in the environment itself. The cruise was part of a continuing program to determine the relationship between changes in the environment and changes in the abundance of skipjack in Hawaiian waters. As on earlier cruises, part of the observations were concentrated in a small area off leeward Lanai, where at certain times the tuna tend to congregate. Skipjack were very scarce in this area during the cruise as compared to earlier cruises, and this provided contrasting conditions of fish abundance useful in comparing changes which may be noted in the sea itself.

A portion of the cruise dealt with a study of the reaction of skipjack to different conditions and substances. The biologists were making these observations from a caisson suspended from the side of the vessel. This caisson, a metal cylinder fitted near the lower end with glass ports, permits an observer to record the activities of the skipjack and bait on film, and to do so while remaining relatively comfortable and dry. During these behavior studies, the reaction of skipjack to blood, red dye, and certain skipjack skin extracts was recorded. In addition, the response of skipjack to a promising new bait fish, the threadfin shad, was tested. It appeared that the shad are indeed acceptable to the skipjack, as they were eaten up almost as soon as they hit the water. The importance of developing a reliable auxiliary bait supply is well known to all segments of the fishing industry and the threadfin shad is one of two fish being tested at present, the other being the tilapia.

Once during August and once during September the Charles H. Gilbert participated in the International Geophysical Year program by conducting hydrographic stations off Barbers Point, Oahu.

Pacific Salmon Investigations

TESTS ON "ENDLESS" FISHWAY TO CUT IN CONSTRUCTION COSTS: An endless fishway has been installed at the Fisheries Engineering Research Laboratory at Bonneville Dam and is being used in experiments in Seattle.

The endless ladder, first of its kind ever built, seeks to answer the questions: To what height will a salmon ascend a fishway? How fatigued does a fish become in climbing a large number of pools? What is the comparison in swimming performance in various steepness of fish ladders?

There are two endless fishways, one of standard slope (a rise of one foot every 16 feet) and the other steeper (a rise of one foot in eight feet). The fishway structures are rectangular units with a lock that connects the highest pool to the lowest pool. The fish enters the lock and the water is exhausted to the lowest level in the fishway from which the salmon starts his passage. The cycle will be repeated as many times as the fish continues to climb the watery treadmill.

Upon completion of the fishway runs, biochemists will make studies to determine the state of fatigue in the salmon.

No one knows how high a fish will ascend a fishway as there are no dams in the Columbia River at present that require salmon to ascend more than 100 feet. In the experimental fishway there is no limit to how high a fish can go other than physical abilities and inclination of the fish. It is hoped the fish will "climb" at least 100 pools without showing signs of undue fatigue.

Tests to date at the Bonneville Laboratory show promise of reducing costs of future fishway construction. These narrower and steeper fishways would, of course, be a tremendous saving in costs of future fish passage facilities at proposed damsites.

In the short period of operation, many interesting facts and sidelights on the anadromous runs of fishes in the Columbia River have been observed by the scientists. For example, the steelhead trout chose a darkened passageway to a light one in the preference tests; they could even swim very rapidly in the dark without visual reference; and they could swim in very fast water (up to 16 feet per second) that stopped salmon movement. The biologists had to build an extension wooden fence on top of an eight-foot high cement wall to keep the steelhead from jumping over at the entrance to the laboratory and one fish demonstrated his jumping skill by leaping some eight feet from the holding pool and breaking a large 1,000-watt mercury-vapour lamp overhead.

The king salmon registered some likes and dislikes with the biologists too. Some climbed six pools in the experimental ladder in 46 seconds while some loitered in a single pool for nearly three hours. They preferred the walls to the center of the pool when passing a weir, and they showed their sense of smell is keen. If a worker accidentally placed his hand or foot into the water the fish would take to the bottom and not move for a half hour or so. (Outdoor California, September 1958, of the California Department of Fish and Game.)

Safety Aboard Fishing Vessels

NEW WINCH-HEAD CONTRIBUTES TO TRAWLER SAFETY: Operational methods used to handle the heavy fishing gear employed in otter trawling have remained practically unchanged since the introduction of this fishery in Boston in 1905. Improvements in trawler construction and design, more efficient propulsion machinery, and navigational aids and fishing equipment have progressed steadily, while trawl-net setting and hauling operations on board the offshore trawling fleet differ but slightly today from those performed by the fishing crews over the past 30 years.

In an effort to eliminate manual handling of wire cables in two of the most hazardous operations connected with this fishery, the U. S. Bureau of Commercial Fisheries recently installed a new type winch-head on board the Bureau's exploratory fishing and gear research vessel Delaware.

Records indicate that many serious accidents occur at the winch-heads when fishermen are using the messenger wire or fish tackle to "hook-up" the towing cables or hoist inboard the fish catch in the cod end of the trawl net. Both operations entail wrapping the wires around a revolving winch-head with the friction of the wire on the drum producing the power point for the lifting operation. Depending on the weight and strain involved, from 4 to 7 complete turns of the wire are needed to hook up the towing wires or to hoist the fish bag inboard.

Even under ideal weather conditions, performance of these tasks are considered dangerous, with greatly increased hazards when carried out during rough weather conditions prevailing on the offshore banks at least 25 percent of the season. Substitution of mechanical for manual handling of these duties should eliminate two especially hazardous tasks.

Fabrication of a new type winch-head was completed recently and installed on board the Delaware. The inner drum of the winch is flange-protected to guard against excessive wire build up, with a holding stud fitted into the center of the drum for attaching the eye splice in the end of the wire.

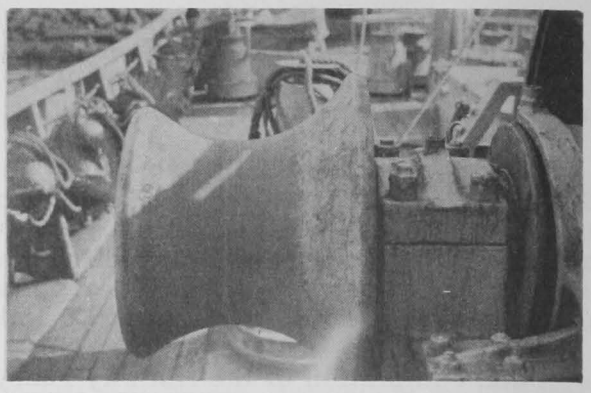


Fig. 1 - Conventional-type winch-head used aboard the exploratory fishing vessel Delaware prior to installation of the new one.

Testing of the device was carried out during a recent trip of the Delaware. Both operations were handled speedily and smoothly on the new drum without manual guidance of the wires.

Application of this device is limited at present to boats equipped with trawling winches capable of reversing action. Because of the difficulty in removing the wire from the drum, the winch must be reversed unless sufficient slack is present to allow the wire to be slipped off the drum. Modifications are indicated before the device can be adapted for use on boats with nonreversible winches.

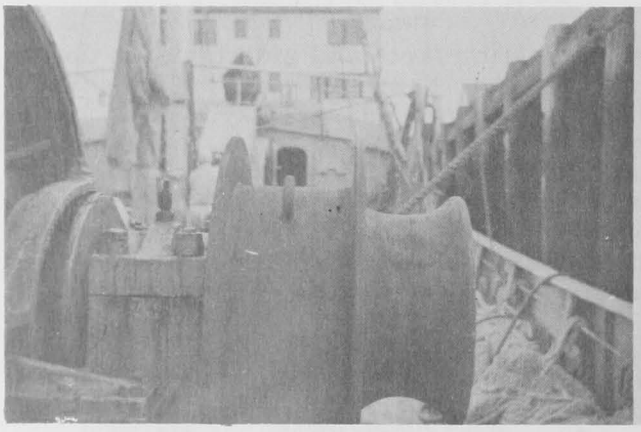


Fig. 2 - New double-barrelled winch-head with holding stud recently installed on the M/V Delaware.

Fig. 3 - Hook-up operation completed--messenger wire on new winch-head on the M/V Delaware.

* * * * *

UNSAFE CONDITIONS ABOARD NEW ENGLAND TRAWLERS LISTED: The Bureau of Commercial Fisheries New England safety program staff has prepared a list of unsafe conditions found on New England large and medium otter trawlers. The list is "far from complete," but elimination of these hazards and conditions could contribute greatly towards reducing the present accident rate, and save both lives and money.

1. No Guard Rails on Deck Bollards: Guard rails should be mandatory equipment on all large and certain medium-size trawlers.

2. Trawl-Wire Spooling Mechanism: Installed on a very few of the large trawlers--should be mandatory on all large and certain medium-size trawlers. Situation not too critical in small otter-trawl fleet.

Fig. 1 - Various nonskid materials which could be used to improve deck-footing conditions on fishing vessels. These were exhibited this past summer at the dock of the U. S. Bureau of Commercial Fisheries exploratory fishing vessel Delaware prior to sailing on a safety cruise.

3. Towing-Block Snubbing Chain: Install chain on all blocks to prevent block from flying inboard when trawling wires are released. Recommend this be made mandatory for all large trawlers.

4. Installation of Pilothouse Winch Control Switch (Electric-Driven Winches Only): Should be installed within easy reach of man in pilothouse for use in emergencies only. Would provide a double check on winch operator and introduce extra safety factor to a potentially-dangerous operation.

5. Inadequate Guards on Chain-Driven Power Takeoffs: Many medium trawlers operate trawl winches by means of a direct-chain drive from main engine. Invariably, the chain drives are poorly guarded and jammed up in an almost inaccessible location. Recommend a complete guard enclosing all chain drives.

6. Smooth Deck Surfacing: Injuries resulting from falls on shipboard comprise a large part of all fishing fleet insurance claims. While deck footing conditions during actual fishing operations are admittedly hazardous, addition of abrasive material to main deck working areas would assure safer footing. Application of skid-resistant materials presents an inexpensive means of combating shipboard injuries from falls, and should be required on all fishing vessels.

7. Insufficient Clearance on Mast Ladders: Inspection of mast ladders show that many are set too close to the mast with insufficient toe room for climber. Ladders should be positioned for ample foot clearance for climber and space to allow leg entry between ladder and mast.

8. Unlighted Boat Launching Areas: Lifeboat launching areas should be adequately lighted--preferably with a battery-operated light independent of vessel's main power supply.

9. Fuel Supply Shut-off Valve: A fuel supply shut-off valve should be located outside of main engineroom for emergency stops in the event that access to the engineroom is blocked.

10. Carbon Tetrachloride and CCl_4 Formula Fire Extinguishers: Should not be carried on shipboard where fires are invariably fought in enclosed spaces. Replace with dry powder or CO_2-type extinguishers.

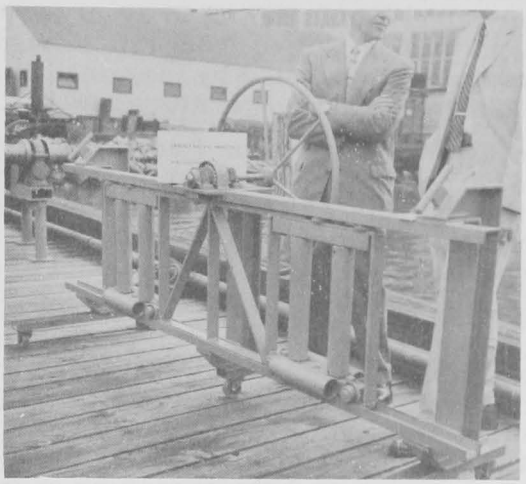


Fig. 2 - Trawl-wire spooler on display at a safety exhibit.

11. Rigging of Lifelines During Heavy Weather: When vessels are jogging or running in heavy weather, lifelines should be rigged from forecastle to breakdeck and further aft to galley entrance if indicated.

12. Pyrofax Gas Burners in Galley and Engine Room: Gas heavier than air and highly explosive--extremely dangerous when leaks occur and gas settles in bilges.

13. Worn or Slippery Companionway Steps: Frequently found on medium and small boats and unnoticed until an accident happens. Addition of treads to steps would afford maximum protection.

14. Unvented Fuel Filling Pipes: Vent pipes should be required for all fuel-filling lines to prevent overflow of fuel into bilges.

15. Inspection Standards for all Commercial Fishing Vessels: Fishing vessels should be subject to official inspection and maintenance standards, with certification by marine surveyors. With the cooperation of the fishing industry and insurance companies, standards can be developed for various classes of boats, based on tonnage, type of fishing, or combinations of both factors. Major subjects would include--hull construction, engine installation, deck and fishing equipment condition and layout, fire-fighting equipment, safety appliances, life-saving equipment, and periodic inspections.

* * * * *

UNSAFE PRACTICES ABOARD NEW ENGLAND TRAWLERS LISTED: The U. S. Bureau of Commercial Fisheries New England Safety Program staff has prepared a list of unsafe practices found on New England large and medium otter trawlers. The list is "far from complete," but elimination of these hazards and practices could contribute greatly towards reducing the present accident rate, and save both lives and money.

1. Crossing Over Trawl Wires While Wires are in Motion: It is common practice for the men to step over the trawl wire during setting and hauling of the trawl net. This is an extremely dangerous act particularly during net setting when the wires are speeding through the deck bollards, and a slip would throw the man onto the wire and through the bollard. This act should be outlawed on all large and medium vessels. Guard rails for deck bollards, similar to the type now found on the Bureau's M/V Delaware, and the trawlers Luckimee and Cashmeer, should be made mandatory equipment on all large and medium trawlers.

2. Hand-Steering of Trawl Wires on Winch Drums: An extremely dangerous situation in which men stand directly in front of trawling winch and by means of heavy steel bars attempt to evenly spool incoming wire onto winch drum. Many accidents have resulted from this hazardous arrangement. Installation of a steering arrangement operated by the winch operators from back of the winch should be made mandatory on all large otter trawlers.

3. Winch Operator Leaving Station During Hauling Operation: A common practice, especially on the medium trawlers, is for the winch operator to leave his post at the controls while the trawl wire is being retrieved. While the operator may not stray more than a few feet away from his post, this could result, and has in the past resulted, in serious accidents both to personnel and equipment, due to operator's delay in reaching the winch-stop control.

4. Using Improper Tools to Release Towing Wires from Hook-Up Block: During fishing operations the trawling wires are locked into a towing or hook-up block attached to the stern quarter of the vessel and held in the block by a hinged steel section secured by a heavy locking pin. Release of towing wires prior to hauling the net is done by removing locking pin and prying or knocking hinged section upwards. In many cases a short wrench or spanner is used and the violent spring of the released block strikes the tool or hand of the operator. A long heavy bar is indicated for this operation and should be provided and used for this act.

5. Use of Improvised Platform to Reach Trawl Doors in Gallows: Use of wooden rollers, boxes, or similar items, placed under the forward gallows to allow men to reach fishing gear is a common practice on large vessels. This presents an insecure footing and can be eliminated by installing a steel platform at the base of the gallows, of sufficient height as needed.

6. Leaving Deck Bunker Plates Open and Unattended: Many vessels have deck bunker plates for loading fish below deck and also used to unload fish at dockside. Occasionally, the openings are left unguarded and present a definite hazard to the unwary--this is especially dangerous when allowed during unloading operations when other than regular crew members are working on board.

Sea Trout

TAGGING TO STUDY MIGRATIONS AND GROWTH RATE: In order to study the migrations and growth rate of spotted sea trout (Cynoscion nebulosus), biologists of the Marine Laboratory of the University of Miami at Coral Gables, Fla., have tagged 414 fish, 201 of which were tagged in the Fort Myers area and the rest around Cedar Keys.

The tags being used in this program are not visible from the outside as they are placed inside the body cavity of the fish. This causes no permanent injury as the tag is inserted through a very small incision cut in the fish. The tags have been used successfully on Pacific sardines, Atlantic gray sea trout, and other species.

The tags (green in color) made of plastic, 1.25 inches in length and 0.25 inch wide, can be seen as soon as the fish is caught and eviserated. Instructions are printed on the tags for their return to the nearest commercial fish dealer, where the finder will receive a reward of 75 cents for each tag.

Spotted sea trout were tagged from Fort Myers to Pensacola. However, it is quite possible that these tagged fish may be caught far afield and fish-

ermen are requested to examine all spotted sea trout caught.

This tagging program is part of the work being done by the Laboratory for the Florida State Board of Conservation.

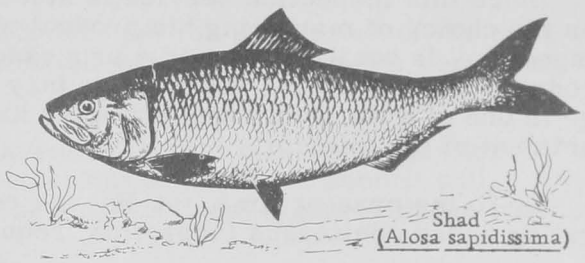
Shad

BIOLOGISTS DISCOVER SHAD PASS SAFELY THROUGH TURBINES OF CONOWINGO DAM: The preliminary phase of the 3-year Susquehanna fishery study is well under way, according to the Chairman of the Advisory Committee and Director of the Maryland Department of Research and Education, Chesapeake Biological Laboratory, Solomons, Md. The project is designed to provide a sound biological basis for deciding whether or not passage should be provided for migratory fish at Conowingo Dam which is located near the confluence of the Susquehanna River and Chesapeake Bay in Maryland.

Shad planted in Conowingo Reservoir were able to pass successfully out of the impoundment and through the turbines of the dam, according to the five-man Advisory Committee which recently reviewed the work of biologists on the Susquehanna fishery study project during 1958.

A total of 2,983 shad were tagged, of which 2,086 were planted above the Conowingo Dam last spring to determine whether they would survive, spawn, and successfully negotiate the dam on their downstream migration. Tags received by biologists from fishermen who caught the fish below the dam amounted to 6 percent of the shad planted above the dam. The 83 fish that passed through the turbines confirmed earlier evidence that fish would live. The spillway gates were not open between the dates of tagging and recapture.

Two of the tagged shad were reported caught at Cape Charles, Va., one 8 days and the other 28 days after being released. Another tagged shad was taken in the Potomac River 14 days after tagging. Recaptures of most of the tagged fish, however, were concentrated in the area of Chesapeake Bay between Baltimore and the Susquehanna River. An angler caught one of the shad above the dam.



Shad
(Alosa sapidissima)

Balloons and shad seem unrelated, and yet some interesting information was obtained by attaching them to the fish with long nylon lines in an attempt to follow their movements after release. The shadow of the railroad bridge across the mouth of Conowingo Creek apparently appeared to act as somewhat of a barrier to the shad tagged with balloons.

Standards

MEETINGS HELD ON PROPOSED HADDOCK AND HALIBUT STANDARDS: Halibut steaks and frozen haddock fillets are due to be added to those fishery products for which quality standards are promulgated, according to the present plans of the U. S. Bureau of Commercial Fisheries.

Laboratory research by the Bureau on the proposed standards has proceeded to a point that permitted preliminary discussions with interested segments of the fishing industry, distributors, and consumers. These discussions were held in four key cities.

Following the preliminary discussions, the next stop is the formal Notice of Proposed Rule Making. Such notice provides for a 30-day period to permit further consideration by the industry and others, after which the formal standards and the effective dates will be announced.

The meetings were held on the dates indicated in the following cities: Boston, frozen haddock fillets, October 7, 1958; New York City, frozen haddock fillets and halibut steaks, October 8; Chicago, frozen haddock fillets and halibut steaks, October 10; Seattle, frozen halibut steaks, October 15.

Promulgation of quality standards and maintenance of an inspection service are responsibilities transferred from the Department of Agriculture to the Department of the Interior on July 1, 1958. Previously standards had been developed by the Department of the Interior but promulgation of the standards and the inspection of fishery products had been the legal responsibility of the Department of Agriculture.

Standards which are already in effect apply to frozen fried fish sticks, frozen raw breaded shrimp, and frozen fish blocks, which are the raw material from which fish sticks are made. Fish sticks and shrimp which have been processed in accordance with these standards may be identified by the consumer as "Grade A" or "Grade B," both of which meet rigid standards of wholesomeness and workmanship and have been processed under sanitary conditions.

There are many fishery products for which standards have not yet been established. These can not be given a "grade" designation but if they have been processed under continuous inspection they are so marked.

Since this inspection service is something for which the processor must pay, he has the choice of marketing his product with or without the inspection symbol. "Lot inspection" is available should a processor desire only occasional inspection of his product. In such a case the package may bear the following statement: "This package is one of a lot from which samples have been inspected by the United States Department of the Interior."

Up to the present time, the Bureau reports, 16 large processing plants are operating under continuous inspection, requiring the services of 22 trained inspectors.

Transportation

PAPER STRIPS REVEAL TEMPERATURE CHANGES IN PERISHABLE PRODUCTS WHILE IN TRANSIT: Simple and inexpensive, heat-sensitive recorders show whether perishable products are subject to excessive temperature and how much. A Milwaukee yeast company is monitoring shipments with "paper thermometers" that travel with the products to give warning of harmful temperature fluctuations. But so far whether this will work with frozen products is not known.

Dispatchers and carriers of perishable products know that high shipping temperatures speed deterioration. And they generally take steps to minimize such hazards, even calling for special routing. But does your own control of product quality extend beyond the shipping dock?

Specifically, if your heat-sensitive goods were to be received in substandard condition, could you quickly tell whether they were inferior before shipment or were damaged by high temperature in transit?

The company using the "paper thermometers" ships heat-sensitive materials from one plant to another, from plant to customer, and from distribution points and sales areas to laboratories for examination and study. Before instituting the monitoring system, certain atypical variations were noted in goods arriving by rail, truck, and air carrier. Although improper conditions in transit were suspected, adequate evidence and proof were lacking.

As a result, an inexpensive thermal monitor called the "Thermonitor" was designed. It consists of three different strips of specially-treated paper. The strips are glued to the back of a mimeographed, self-addressed postcard, which gives brief instructions for marking and mailing.

An additional alerting tab, in the form of a sleeve, bears the note: "Fill in This Card and Mail." This further serves to protect the paper thermometer against undue friction.

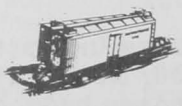
The company places a card in a single package or in several units of a large shipment. When goods reach their destination, consignee notes the strips' colors in the spaces provided on card, then returns it to sender or central laboratory for recording and filing.

During the past three years, this technique has revealed temperatures above 120° F. in several truck, parcel post, and express deliveries.

As would be expected, high temperatures in trucks usually occur during summer months. However, overheating in parcel post and express shipments can happen during any season.

Here is how the paper strips indicate excessive shipping temperature:

Normally, they are pearl-gray in color, but turn black when exposed at or beyond their designated temperatures. They also tend to blacken under compression caused by friction and stamping, but this shading can readily be distinguished from the "melted" appearance of an overheated strip. (Food Engineering, August 1958.)



U. S. Fish Stick Production

JULY-SEPTEMBER 1958: The United States production of fish sticks during the third quarter of 1958 amounted to 13.7 million pounds, an increase of 588,000 pounds (or 4 percent) as compared with the third quarter of 1957. The peak month of the 1958 third quarter was September when 5.1 million pounds were reported, and July and August followed with 4.3 million pounds each.

Table 1 - U. S. Production of Fish Sticks, July-September 1958[1/]

Months	Cooked	Uncooked	Total
	(1,000 Lbs.)		
July	3,964	370	4,334
August	3,832	437	4,269
September	4,570	566	5,136
Total 3rd quarter 1958	12,366	1,373	13,739
Total 3rd quarter 1957	11,752	1,399	13,151
Total first 9 months 1958	40,295	4,169	44,464
Total first 9 months 1957	35,036	3,819	38,855

1/ Preliminary.

Table 2 - U. S. Production of Fish Sticks, by Areas, July-September 1958 and 1957

Area	1958[1/]		1957[2/]	
	Number of Firms	1,000 Lbs.	Number of Firms	1,000 Lbs.
Atlantic Coast States	21	10,753	23	10,868
Inland & Gulf States	4	1,759	4	1,207
Pacific Coast States	11	1,227	11	1,076
Total	36	13,739	38	13,151

1/ Preliminary. 2/ Revised.

Cooked fish sticks (12.4 million pounds) accounted for 90 percent of the total production, while uncooked fish sticks (1.4 million pounds) made up the remaining 10 percent.

The Atlantic Coast States led all other areas with 10.8 million pounds (or 78 percent) of the total production. The inland and Gulf States were second with 1.8 million pounds (or 13 percent), followed by the Pacific Coast States with the remaining 1.2 million pounds (or 9 percent).

During the first nine months of 1958, a total of 44.5 million pounds of fish sticks was produced--an increase of 5.6 million pounds over the same period of 1957. Cooked fish sticks were up 15 percent as compared with the quantity reported for the same period of 1957, and uncooked fish sticks were 9 percent above last year.

United States Fishery Landings, January-September 1958

Landings of fish and shellfish in the United States and Alaska the first nine months of 1958 were only one percent below those for the same period of 1957. By the end of August 1958, landings were seven percent below those for last year, but in September large catches of sardines in California and menhaden in Delaware and Virginia closed most of the gap.

Sardine landings in California were 120 million pounds greater through October 23 this year than for the same period of 1957. Salmon landings in Alaska in the 1958 season were up 45 million pounds. Tuna landings in California for the first three quarters of 1958 were nearly 21 million pounds higher than for the same period of the preceding year. Ocean perch landings in New England were up 18 million pounds.

Menhaden landings, which were 128 million pounds behind at the end of August, improved in September. This year's landings at the end of that month were only 61 million pounds below the first nine months of 1957. Jack mackerel landings continued light and totaled less than three million pounds for the first nine months this year. During the same 1957 period, landings amounted to over 65 million pounds. Herring landings in Maine (106 million pounds) were practically the same as last year. Herring production in Alaska, however, was short by 35 million pounds. Landings of anchovies in California and whiting in New England were both down around 29 million pounds.

Table 1- United States Fishery Landings of Certain Species for Periods Indicated, 1958 and 1957 1/

Species	Period	1958	1957	Total 1957
		.....(1,000 Lbs.).....		
Anchovies, Calif.	9 mos.	6,322	36,798	38,408
Cod:				
Maine	8 mos.	2,355	1,913	2,032
Boston	9 "	13,112	14,931	17,487
Gloucester ...	9 "	2,315	1,473	2,020
Total Cod ..		17,782	18,317	21,539
Haddock:				
Maine	8 mos.	2,973	3,439	4,097
Boston	9 "	70,477	78,145	93,617
Gloucester ...	9 "	8,342	7,578	8,898
Total haddock		81,792	89,162	106,612
Halibut 2/:				
Wash. &Oreg.	9 mos.	15,411	15,012	15,430
Alaska	9 "	19,888	20,679	20,733
Total halibut		35,299	35,691	36,163
Herring:				
Maine	8 mos.	106,474	106,945	153,621
Alaska	Year	82,800	118,290	118,290
Industrial fish, Maine&Mass. 3/	9 mos.	105,004	100,128	112,446
Mackerel:				
Jack	9 mos.	2,554	65,223	86,300
Pacific	9 "	13,504	26,166	55,200
Menhaden	9 mos.	1,321,451	1,332,027	1,681,600
Ocean perch:				
Maine	9 mos.	58,946	50,473	64,723
Boston	9 "	1,823	2,920	3,819
Gloucester	9 "	62,382	52,066	65,389
Total ocean perch		123,151	105,459	133,931
Salmon:				
Washington ...	9 mos.	46,276	39,871	43,273
Oregon	8 "	6,701	9,353	11,370
Alaska	Year	248,000	203,437	203,437
Sardines, Pacific	to Oct. 23	141,570	21,925	45,800
Scallops, sea, New Bedford	9 mos.	11,848	12,939	16,461
Shrimp (heads-on), South Atlantic and Gulf States ...	6 mos.	60,252	70,377	168,737
Squid, California.	9 mos.	4,862	10,670	12,449
Tuna, California .	9 mos.	261,648	240,914	291,234
Whiting:				
Maine	8 mos.	22,554	15,597	15,810
Boston	9 "	332	956	1,002
Gloucester ...	9 "	36,000	71,005	76,521
Total whiting		58,886	87,558	93,333
Total all above items		2,736,176	2,781,249	3,428,204
Others (not listed)		498,451	486,615	1,321,796
Grand Total		3,234,627	3,267,864	4,750,000

1/Preliminary. 2/Dressed weight. 3/Excluding menhaden.

Table 2 - United States Fishery Landings by States for Periods Indicated, 1958 and 1957 1/

Area	Period	1958	1957	Total 1957
		.....(1,000 Lbs.).....		
Maine	8 mos.	214,057	202,722	290,528
Massachusetts:				
Boston	9 mos.	100,478	108,241	135,072
Gloucester ..	9 "	182,681	207,599	248,928
New Bedford .	9 "	87,754	79,969	104,334
Provincetown .	9 "	17,952	19,017	25,109
Total Mass.		388,865	414,826	513,443
Rhode Island 2/.	6 mos.	53,413	63,358	121,273
New York 2/...	8 "	27,898	28,969	40,223
New Jersey 2/..	8 "	31,281	36,558	50,541
North Carolina .	9 "	45,450	43,824	64,634
South Carolina .	8 "	9,408	7,835	24,316
Georgia	8 "	11,217	10,734	18,584
Florida	8 "	91,924	86,553	140,698
Alabama	7 "	5,362	6,670	11,882
Mississippi ...	7 "	8,298	13,200	19,991
Louisiana 2/...	4 "	15,840	15,977	63,322
Texas 2/.....	8 "	35,463	44,453	77,156
Ohio	9 "	15,042	22,815	22,844
Oregon	8 "	44,112	44,093	67,694
Washington:				
Salmon	9 mos.	46,276	39,871	43,273
Other	6 "	56,023	45,189	99,478
California:				
Certain species 3/	9 mos.	430,460	401,695	529,391
Other	5 "	35,932	35,752	86,862
Total Calif.		466,392	437,447	616,253
Rhode Island, Middle Atlantic, Chesapeake, South Atlantic, and Gulf States (menhaden only)	9 mos.	1,317,618	1,360,364	1,661,480
Alaska:				
Halibut 4/....	9 mos.	19,888	20,679	20,733
Herring	Year	82,800	118,290	118,290
Salmon	Year	248,000	203,437	203,437
Total all above items		3,234,627	3,267,864	4,280,073
Others not listed		5/	5/	469,927
Grand Total		5/	5/	4,750,000

1/Preliminary.
2/Excludes menhaden landings.
3/Includes catch of: anchovies, jack and Pacific mackerel, Pacific sardines, squid, and tuna. Data on sardines are through October 23.
4/Dressed weight.
5/Data not available.
Note: Data principally represent weight of fish and shellfish.

U. S. Foreign Trade

EDIBLE FISHERY PRODUCTS, JULY 1958: Imports of edible fresh, frozen, and processed fish and shellfish into the United States during July 1958 were up 21.2 percent in quantity and 11.0 percent in value as compared with the preceding month. Increases in July over June this year were due primarily to a sharp increase in the imports of groundfish fillets and blocks (28.9 million as compared with 19.8 million pounds); and canned tuna in brine and frozen albacore tuna from Japan.

Table 1 - United States Foreign Trade in Edible Fishery Products, July 1958 with Comparisons

Item	Quantity			Value		
	July		Year	July		Year
	1958	1957	1957	1958	1957	1957
	Millions of Lbs.			Millions of $		
Imports:						
Fish & shellfish:						
Fresh, frozen, & processed	100.9	89.1	837.0	28.3	25.7	248.4
Exports:						
Fish & shellfish:						
Processed only 1/ (excluding fresh frozen)	1.9	3.9	69.7	1.0	1.0	16.8

1/ Includes pastes, sauces, clam chowder and juice, and other specialties.

As compared with July 1957, imports this July were higher by 13.3 percent in quantity and 10.1 percent in value. Imports were higher for fresh and frozen tuna (up about 2.6 million pounds), canned tuna in brine (up about 2.1 million pounds), frozen salmon (up about 1.0 million pounds), and groundfish fillets and blocks (up 6.4 million pounds). Imports of lobster and spiny lobster were lower by 2.7 million pounds this July as compared with July a year earlier.

United States exports of processed fish and shellfish in July 1958 were lower by less than one percent in quantity but higher by 66.7 percent in value as compared with June 1958. Compared with the same month in 1957, exports in July 1958 were down by 50.6 percent in quantity and unchanged in value. Exports this July as compared with the same month in 1957 were made up primarily of higher-priced products such as canned salmon.

Exports of canned California sardines, anchovies, and mackerel were down substantially because of the very light packs of those products the last half of 1957 and the first half of 1958.

* * * * *

IMPORTS OF CANNED TUNA IN BRINE UNDER QUOTA: The quantity of tuna canned in brine which may be imported into the United States during the calendar year 1958 at the 12½-percent rate of duty has been established as 44,693,874 pounds. Any imports in excess of this established quota will be dutiable at 25 percent ad valorem.

Imports from January 1-October 4, 1958, amounted to 38,069,410 pounds, according to data compiled by the Bureau of Customs. This leaves a balance of 6,624,464 pounds of the quota which may be imported during the balance of 1958 at the 12½-percent rate of duty. Last year from January 1-September 28 a total of 30,034,996 pounds had been imported.

* * * * *

FISHERY PRODUCTS EXPORTS LOWER IN 1957: Foreign markets bought less fishery products from the United States in 1957 than in 1956. Principal declines occurred in trade with the Philippines, West Germany, and the Netherlands. The decline was mainly due to reduced exports of canned sardines and fish oil.

United States fishery industries depend on foreign market outlets for many of their products. During 1957, about 289 million pounds of United States fishery products were exported to foreign markets. These products were valued at $36 million. During 1956, 325 million pounds, valued at almost $40 million, were sold abroad.

Canada, the Philippines, and West Germany were the three leading markets in 1957, taking fishery products valued at $8.3, $6.0, and $5.0 million, respectively. Canada's trade increased slightly over that of 1956; that with the Philippines declined by $2 million; and West Germany trade dropped by about $1 million. The Netherlands, among the leaders in previous years, in 1957 dropped behind the United Kingdom which was in fourth place in dollar value of trade.

Canned salmon was the most widely-distributed fishery product in our 1957 export trade; this product was sent to 73 countries, and exports were up about 25 percent from 1956. Canned shrimp was exported to 47 countries; canned sardines

to 41; canned tuna to 26; frozen salmon to 21; and fish oil to 23 countries.

Trends by Country: In 1957, Canada spent more dollars for United States fishery products than any other country. The value of United States shipments to Canada totaled $8.3 million. Frozen and canned shrimp, valued at nearly $3.0

Table 1- Value of United States Exports of Fishery Products, by Principal Country of Destination, 1956-57

Country	1957	1956
	($1,000)	
All countries	35,952	39,503
Canada	8,288	7,990
Philippines	6,024	8,058
West Germany	5,098	6,118
United Kingdom	3,708	2,204
Netherlands	2,969	4,956
Sweden	1,682	843
Norway	970	1,065
Cuba	720	727
Japan	669	537
Venezuela	572	492
Belgium	447	574
Italy	259	295
France	258	431
Ecuador	256	288
N. Antilles	239	139
Panama	227	157
Greece	202	257
All others	3,364	4,372

million, were the principal commodities in this trade. Next in value were fur-seal skins (dressed or dyed) valued at $1.9 million.

The Philippines in 1957 imported products valued at $6.0 million, consisting principally of canned anchovies, mackerel, sardines, salmon, and squid. Shipments to the Philippines in 1957 declined by $2.0 million from 1956, mainly owing to reduced shipments of canned sardines. Canned mackerel exports, however, increased by $1.7 million in value from 1956.

West Germany, the principal market for the United States fish oils, imported fishery products in 1957 valued at $5.1 million, and indirectly, was believed to be the ultimate destination for a large part of the fish oils sent to the Netherlands valued at $2.5 million.

The United Kingdom in 1957 bought fishery products valued at $3.7 million, of which canned salmon made up $3.4 million.

Exports to Latin American countries in 1957 totaled $3.2 million. Cuba and Venezuela were the two largest outlets in this area. Exports to Latin America have declined in recent years as a result of reduced shipments of California sardines. The decline was due in part to lower domestic packs of sardines.

Commodity Trends: Fish and fish-liver oils valued at $10.7 million were the largest item in the 1957 export trade. This was a substantial decline from the $12.9 million exported in 1956 (see table 2).

Table 2 - Value of United States Exports of Selected Fishery Products, 1956-57

Commodity	1957	1956
	($1,000)	
Fresh or frozen:		
Salmon	446	694
Oysters, shucked	589	521
Shrimp	1,471	1,202
Mild-cured salmon	226	399
Canned:		
Salmon	4,740	3,606
Sardines, in oil	125	84
Sardines, not in oil	2,654	6,417
Tuna	202	136
Mackerel	2,146	335
Other fish (mainly anchovies)	2,137	2,836
Shrimp	2,410	2,650
Other shellfish (mainly squid)	1,632	1,932
Fish and fish liver-oils	10,725	12,869
Oysters and other shells for feed	571	523
Shells, unmanufactured	775	821
Pearl essence	252	355

Canned salmon exports in 1957 totaled $4.7 million, an increase of $1.1 million from 1956. Most of this gain represented increased shipments to the United Kingdom.

Canned sardine exports in 1957 fell to $2.7 million in 1957, a decline of $3.8 million. Most of this drop was sustained in decreased shipments to the Philippines.

Canned mackerel exports in 1957 were valued at $2.1 million; canned anchovy exports were also about this level. Canned mackerel exports were $1.8 million above their 1956 level, almost entirely accountable to increased shipments to the Philippines.

During 1957 canned shrimp exports were valued at $2.4 million, down slightly from 1956; frozen shrimp exports amounted to $1.5 million, a small gain from the previous year.

* * * * *

VALUE OF IMPORTS OF FISHERY PRODUCTS AT NEW HIGH IN 1957: A new record value for fishery products imported into the United States was reached in 1957 when products valued at $297 million (at the foreign port of shipment) exceeded those of 1956 by 4 percent. Since 1950, there has been an increase of 50 percent in the annual value of fishery imports.

Although a new high in the value of imports was attained in 1957, the quantity was second largest on record, about 1.1 billion pounds. This was greater than the quantity received in 1956 but considerably less than the quantity imported during the record year 1952, when imports of fish meal were about 2-1/2 times those of 1956.

Table 1 - Value of United States Imports of Fishery Products, by Principal Country of Origin, 1956 and 1957

Country	1957	1956
	($1,000)	
All Countries	297,443	281,197
Canada	97,404	95,483
Japan	77,202	70,800
Mexico	25,248	27,815
Norway	11,144	13,620
Peru	9,167	7,320
Union of South Africa	8,554	8,039
Panama	6,291	4,247
Cuba	6,282	5,814
Iceland	6,022	6,200
Portugal	5,507	4,906
Denmark	3,463	2,887

Fishery products imported for food purposes increased to a new record level of 884 million pounds (valued at $251 million) during 1957, surpassing the previous record year of 1954 by 80 million pounds, and of 1956 by nearly 100 million pounds.

Although the total value of fishery imports rose for the eighth consecutive year, the value of non-food products fell to $46.5 million in 1957, the lowest value since 1950. This decrease resulted from reduced fish meal imports, which reached a four-year low value of $9.4 million in 1957.

The United States is the world's leading importer of fishery products. Imports of groundfish fillets contributed about 59 percent of the groundfish used in the United States during 1957; 36 percent of the tuna used in canning, 16 percent of the canned tuna, 42 percent of the lobsters, 35 percent of the shrimp consumed, 14 percent of the canned salmon, and 24 percent of the fish meal.

Trends by Countries: During 1957, Canada, Japan, and Mexico, supplied products which made up two-thirds of the total value of all fishery imports.

Canada, the primary source, supplied products valued at $97.4 million at the foreign port of shipment, an increase

of almost $2 million from 1956. Among the many products from Canada were frozen fillets, frozen and canned salmon, fresh-water fish, and fish meal.

Japan was second in value with products worth $77.2 million, an increase of $6.4 million from 1956. During 1957, 44 percent of the value of fishery products emanating from Japan consisted of tuna. Canned crabmeat, frozen and canned salmon, canned oysters, and pearls were other important products.

Mexico supplied products valued at $25.2 million, a decline of $2.5 million from 1956, owing to reduced shipments of frozen shrimp. Imports from other Latin American countries totaled $30.7 million.

Products imported from Norway were valued at $11.1 million, a $2.5 million drop from 1956. Peru supplied products valued at $9.2 million; the Union of South Africa, $8.6 million; Panama, $6.3 million; Cuba $6.3 million; and Iceland $6.0 million.

Trends by Commodities: Valuewise, fresh or frozen lobsters were the leading item in the import trade, contributing $36.8 million dollars to the exchange balance of the countries supplying this product. Fresh or frozen shrimp (including some canned and dried) was next in value with imports valued at $35.4 million. Groundfish and ocean perch fillets and blocks were third with $25.7 million, followed by canned tuna valued at $17.0 million and frozen tuna, $16.8 million.

Table 2 - Value of United States Imports of Selected Fishery Products, 1956 and 1957[1/]

Commodity	1957	1956
	..... ($1,000)	
Total Imports	297,443	281,197
Fresh or frozen:		
Lobsters	36,827	34,285
Shrimp	35,415	32,986
Tuna	16,765	15,337
Groundfish and ocean perch fillets and blocks	27,417	25,987
Canned:		
Salmon	9,470	11,650
Sardines	8,957	7,110
Crab meat	6,254	5,318
Lobster	5,017	5,031
Tuna	17,002	14,998
Salted cod, haddock, hake, pollock, and cusk	5,587	5,858
Pearls	9,989	8,651
Fish meal	9,717	11,518

1/Value of the foreign port of shipment.

Duties Collected: Duties collected on United States imports of fishery products during 1957 totaled nearly $16.0 million.

Wholesale Prices, October 1958

Price trends for fishery commodities from September to October this year were mixed over a narrow range, but from October 1957 to October 1958 wholesale prices for some products were sharply higher. The October 1958 edible fish and shellfish (fresh, frozen, and canned) wholesale price index (129.6 percent of the 1947-49 average) was down slightly (only by 0.4 percent) from the previous month. But it was up 8.6 percent when compared with October a year ago.

Prices in mid-October 1958 for the drawn, dressed, and whole finfish subgroup were 1.3 percent higher as compared with September. An increase of about 3 cents a pound in fresh and frozen salmon prices more than offset the drop in prices for frozen halibut, fresh-water fish, and large drawn haddock. As compared with October 1957, the subgroup index this October was up 19.3 percent due primarily to higher prices for fresh haddock (up 26.3 percent), fresh and frozen West Coast salmon (up 12.1 percent), and Great Lakes yellow pike (up 15.7 percent). But wholesale prices this October were lower for frozen halibut (down 3.1 percent) and Lake Erie whitefish (down 7.3 percent) compared with the same month of 1957.

The fresh processed fish and shellfish subgroup index for October 1958 was down 2.1 percent from September. Higher fresh haddock fillet prices (up about 7.5 percent) were more than offset by a 5.1-percent drop in fresh shrimp prices. The index this October when compared with October 1957 was higher by 5.2 percent due to a 28.2-percent increase for haddock fillets and a 7.0-percent increase in fresh shrimp prices.

The index for frozen processed fish and shellfish declined 1.2 percent from September to October this year due to a drop of 3.7 percent in wholesale shrimp prices at Chicago.

Fig. 1 - Buyer examining fresh West Coast halibut at Fulton Fish Market, New York City.

Fig. 2 - Barrels of bagged scallops ready for market. Scallop dragger being prepared for next trip at Fulton Fish Market, New York City.

That drop was partially offset by higher frozen fillet prices. This subgroup price index this October was up 11.6 percent as compared with the same month of 1957 because prices for all items in the subgroup were up from 42.0 percent for frozen haddock fillets to only 0.3 percent for frozen shrimp. Ocean perch fillet prices were up by 11.0 percent and flounder fillets by 7.7 percent.

Canned fishery products prices in October this year were about unchanged from the preceding month, but were 2.1 percent above October 1957. From September to October this year an increase of 3.6 percent in pink salmon prices just about offset a drop of 18.8 percent in California sardine prices. Higher prices for canned Maine sardines (up 27.4 percent), canned light meat tuna (up 4.4 percent), and California sardine (1.2 percent) resulted in a 2.1-percent increase in the subgroup index from October 1957 to October this year. During the same period canned salmon prices were down about 5.4 percent. The packing season for Maine sardines and Pacific salmon was about over by the end of October, but tuna canning continued at a record level and the California sardine pack increased so rapidly that it has created a serious marketing problem.

Table 1 - Wholesale Average Prices and Indexes for Edible Fish and Shellfish, October 1958 With Comparisons

Group, Subgroup, and Item Specification	Point of Pricing	Unit	Avg. Prices1/ ($)		Indexes (1947-49=100)			
			Oct. 1958	Sept. 1958	Oct. 1958	Sept. 1958	Aug. 1958	Oct. 1957
ALL FISH & SHELLFISH (Fresh, Frozen, & Canned)					129.6	130.1	129.9	119.3
Fresh & Frozen Fishery Products:					149.2	150.0	147.2	133.1
Drawn, Dressed, or Whole Finfish:					160.2	158.1	152.7	134.3
Haddock, lge., offshore, drawn, fresh	Boston	lb.	.15	.15	149.0	151.9	113.7	118.0
Halibut, West., 20/80 lbs., drsd., fresh or froz.	New York	lb.	.34	.37	106.2	113.2	114.5	109.6
Salmon, king, lge. & med., drsd., fresh or froz.	New York	lb.	.81	.78	182.6	174.2	178.7	162.9
Whitefish, L. Superior, drawn, fresh	Chicago	lb.	.65	.65	161.1	161.1	132.6	158.7
Whitefish, L. Erie pound or gill net, rnd., fresh	New York	lb.	.90	2/.99	182.0	200.2	177.0	197.2
Yellow pike, L. Michigan & Huron, rnd., fresh	New York	lb.	.59	.60	138.4	140.7	179.4	119.6
Processed, Fresh (Fish & Shellfish):					140.8	143.8	142.4	133.8
Fillets, haddock, sml., skins on, 20-lb. tins	Boston	lb.	.50	.47	170.1	158.2	131.0	132.7
Shrimp, lge. (26-30 count), headless, fresh	New York	lb.	.83	.88	131.1	138.2	143.8	122.5
Oysters, shucked, standards	Norfolk	gal.	6.00	6.00	148.5	148.5	142.3	148.5
Processed, Frozen (Fish & Shellfish):					133.1	134.7	133.6	119.2
Fillets: Flounder, skinless, 1-lb. pkg.	Boston	lb.	.42	.41	108.6	107.3	106.0	100.8
Haddock, sml., skins on, 1-lb. pkg.	Boston	lb.	.41	.40	127.1	124.0	109.9	89.5
Ocean perch, skins on, 1-lb. pkg.	Gloucester	lb.	.30	.29	120.8	116.8	114.8	108.8
Shrimp, lge. (26-30 count), 5-lb. pkg.	Chicago	lb.	.83	.87	128.5	133.5	137.3	128.1
Canned Fishery Products:					101.8	101.9	105.7	99.7
Salmon, pink, No. 1 tall (16 oz.), 48 cans/cs.	Seattle	cs.	21.75	21.00	113.5	109.6	120.0	120.0
Tuna, lt. meat, chunk, No. 1/2 tuna (6-1/2 oz.), 48 cans/cs.	Los Angeles	cs.	11.95	11.95	86.2	86.2	86.2	82.6
Sardines, Calif., tom. pack, No. 1 oval (15 oz.), 24 cans/cs.	Los Angeles	cs.	4.30	5.30	100.4	123.7	132.4	99.2
Sardines, Maine, keyless oil, No. 1/4 drawn (3-3/4 oz.), 100 cans/cs.	New York	cs.	8.22	8.22	87.5	3/ 87.5	82.2	68.7

1/ Represent average prices for one day (Monday or Tuesday) during the week in which the 15th of the month occurs. These prices are published as indicators of movement and not necessarily absolute level. Daily Market News Service "Fishery Products Reports" should be referred to for actual prices.
2/ Revised.
3/ Revised.